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CLIMATOLOGICAL DATA FOR SOUTHERN SOUTH AMERICA

BY

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SUPPLEMENTS TO THE MONTHLY WEATHER REVIEW

During the summer of 1913 the issue of the system of publications of the Department of Agriculture was changed and simplified so as to eliminate numerous independent series of bureau bulletins. In accordance with this plan, among other changes, the series of quarto bulletins—letters from A to Z—and the octavo bulletins—numbered from 1 to 44—formerly issued by the U. S. Weather Bureau have come to their close.

Contributions to meteorology such as would have formed bulletins are authorized to appear hereafter as Supplements of the MONTHLY WEATHER REVIEW. (Memorandum from the Office of the Assistant Secretary, May 18, 1914.)

These supplements comprise those more voluminous studies which appear to form permanent contributions to the science of meteorology and of weather forecasting, as well as important communications relating to the other activities of the U. S. Weather Bureau. They appear at irregular intervals as occasion may demand, and contain approximately 100 pages of text, charts, and other illustrations.

Owing to necessary economies in printing, and for other reasons, the edition of SUPPLEMENTS is much smaller than that of the MONTHLY WEATHER REVIEW. SUPPLEMENTS will be sent free of charge to cooperating meteorological services and institutions and to individuals and organizations cooperating with the bureau in the researches which form the subject of the respective supplements. Additional copies of this SUPPLEMENT may be obtained from the Superintendent of Documents, Washington, D. C., to whom remittances should be made.

The price of this SUPPLEMENT is 10 cents.

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CLIMATOLOGICAL DATA FOR SOUTHERN SOUTH AMERICA

By W. W. Reed

(Prepared under the direction of the Chief, Climatological Division, Weather Bureau, Washington, D. C.)

INTRODUCTION

The combined area of the countries of Paraguay, Uruguay, Chile, and Argentina includes nearly all of the continent lying south of the Tropic of Capricorn and may be designated as southern South America.

For many years the collection of meteorological data has been under the supervision of central institutions at Buenos Aires (Argentina), Santiago (Chile), and Montevideo (Uruguay), with uniformity of method extending throughout the period of record to all of the subordinate stations of the respective services. Each of the central institutions issues annual reports and, at times, comprehensive climatological summaries.

With the recent extension of the Chilean network of stations to include many interior points throughout the northern half of that country no regions of the large area considered are now left unrepresented, except part of the Gran Chaco of Paraguay, the heights of the Andes, western Patagonia, and the adjoining inhospitable area of southern Chile.

The sources from which data were obtained in summarized form or for tabulation are noted in text or footnotes; the most important of these references and others of special value are given under "Bibliography," p. 23.

Throughout this paper temperatures are expressed in degrees Fahrenheit (°F.), relative humidity in percentage of saturation, cloudiness on the scale 0–10, precipitation in inches, and wind velocity in miles per hour.

GENERAL CONDITIONS

The diversified surface of southern South America may be divided into six divisions as follows: (1) The eastern lowland with a width decreasing from about 600 miles at the Tropic of Capricorn to about 100 miles in northern Tierra del Fuego; (2) the plateau of Argentina with an elevation of 1,000 to 2,000 feet and extending from 27° to 48° S.; (3) the high, rugged Andean region with its lofty volcanic peaks in the north; (4) the elevated Atacama desert of northern Chile; (5) the central valley of Chile stretching between latitudes 30° and 42° S.; and (6) the narrow Pacific highland, whose southern half is indented by numerous inlets and broken, in large part, into countless islands.

From this brief description and in view of the wide range in latitude from northern Chile (17° S.) to southern Tierra del Fuego (55° S.) we may well expect marked contrasts in the values of meteorological elements, some important features of which will now be set forth.

Temperature.—Over the eastern lowland temperature distribution is normal, with isotherms directed approximately east-west, but with advance to higher levels the isotherms bend northward and from the eastern foothills of the Andes on to the Pacific Ocean they have the abnormal north-south direction.

Judging from values at Ollague (48.0°), La Quiaca (48.9°), Puente del Inca (44.0°), Lonquimay (47.1°), Bariloche (47.9°), and Colonia 16 de Octubre (48.0°), the cordilleran region of the Andes from within the Tropics to northern Patagonia has a mean annual temperature more or less below 50° F., the condition prevailing over nearly all of the continent south of Melinka on the Pacific coast and Deseado on the Atlantic coast. West of this strip of greatly elevated land and south to Melinka the mean annual temperature is 50° to 60° over nearly all of Chile, except the coastal region north of Caldera, where it is 60° to 65°. East of the cordilleran area the region with mean annual temperature of 50° to 60° is a narrow strip south to about latitude 35°, beyond which it widens abruptly and includes the eastern coast from near Buenos Aires to Deseado. As is shown more in detail in the discussion of temperatures in Argentina, the regions having mean temperature of 60° to 70° and 70° to 75° are narrow just east of the Andes, but widen immediately to include nearly all of the northern half of Argentina, Uruguay, all of Paraguay except the Gran Chaco, which, with the adjacent part of Argentina, has a mean annual temperature slightly above 75°.

Table 2 gives monthly and annual temperature means for two or more stations in each of eight thermal regions found in this territory. The effect of great elevation is shown in striking manner when we note that La Quiaca (11,358 feet), in latitude 22°, has approximately the same mean annual temperature as Santa Cruz (39 feet), in latitude 52°, and that Puente del Inca (8,948 feet), in latitude 33°, has a mean annual temperature corresponding to that found at Punta Arenas (92 feet) in latitude 53°.

A prominent feature of temperature distribution is the difference between mean temperatures at eastern stations, in the interior and along the Atlantic coast, and those at stations along the Pacific coast. This difference is set forth in Table 3 for several pairs of stations having approximately the same latitude. There we find in January the following remarkable differences: Mision Inglesa-Antofagasta, 13.7° F.; Corrientes-Caldera, 15.5°; Paso de los Libres-Punta Tortuga, 16.5°; Bahia Blanca-Valdivia, 12.5°; Puerto Madryn-Punta Corona, 12.2°. In June the differences, while much smaller, are still considerable in the north; Mision Inglesa-Antofagasta, 8.4°, Corrientes-Caldera, 6.2°.

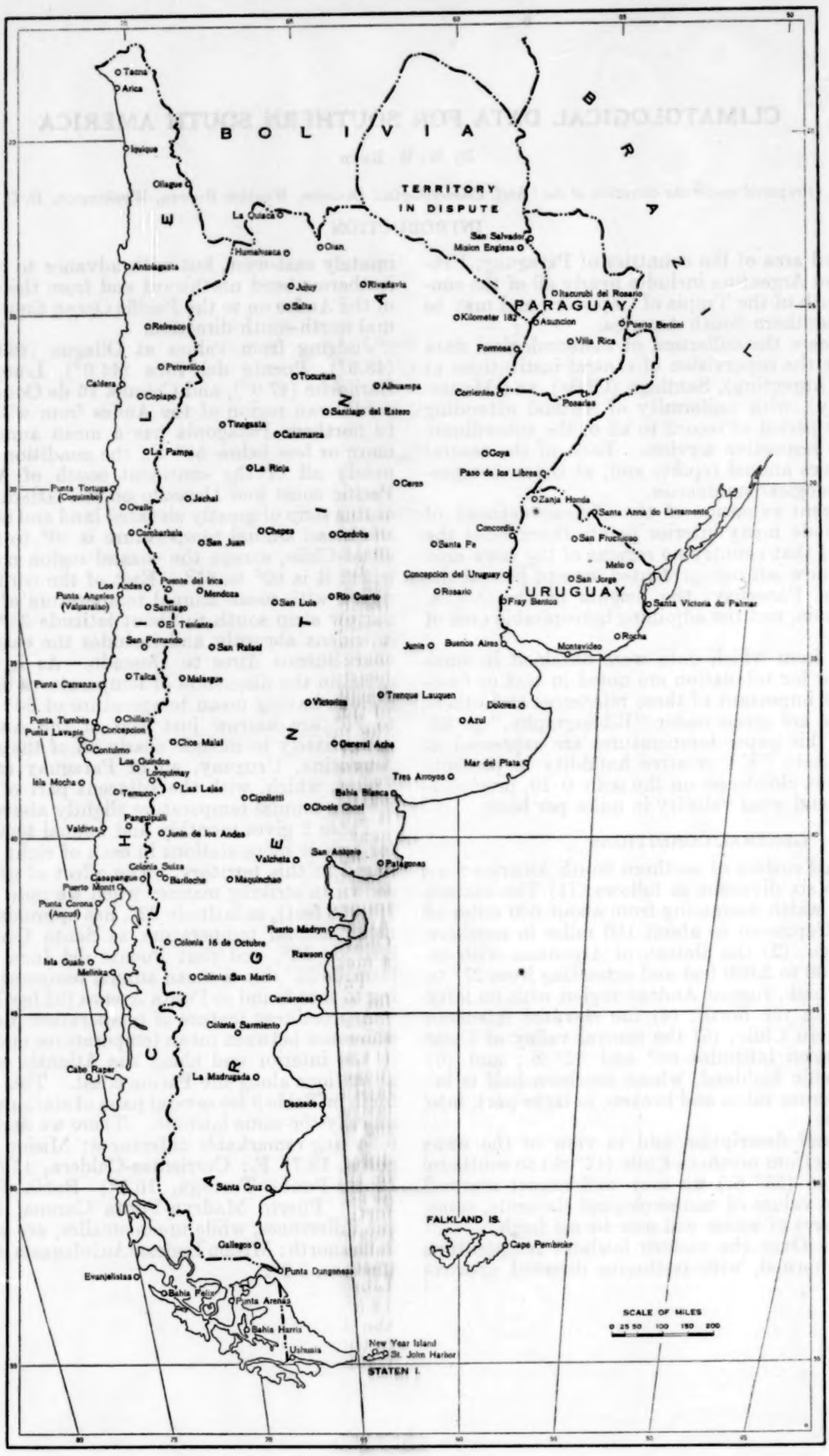
BOLIVIA
TERRITORY IN DISPUTE
PARAGUAY
URUGUAY
CHILE
ARGENTINA
Tacna
Arica
Iquique
Ollague
La Quiaca
Humahuaca
Oran
Antofagasta
Jujuy
Rivadavia
Salta
Reloncavi
Petrerillos
Caldera
Copiapo
Tucuman
Aihuampa
Santiago del Estero
Tinogasta
Catamarca
La Pampa
La Rioja
Punta Tortuga (Coquimbo)
Ovalle
Jachal
Combarbala
San Juan
Chepes
Cordoba
Los Andes
Punta Angeles (Valparaiso)
Puente del Inca
Mendoza
Santiago
San Luis
Rio Cuarto
El Teniente
San Fernando
San Rafael
Punta Carranza
Talca
Malargue
Punta Tumbes
Punta Lavapie
Chillan
Concepcion
Contulmo
Los Cuervos
Lumaymay
Isla Mocha
Temuco
Las Laias
Cipolletti
Pangipulli
Valdivia
Junin de los Andes
Colonia Suiza
Bariloche
Maquinchao
Casapengue
Puerto Montt
Punta Corona (Ancud)
Isla Guafo
Melinka
Colonia 16 de Octubre
Colonia San Martin
Cabo Raper
La Madrugada
Colonia Sarmiento
Deseado
Santa Cruz
Gallegos
Punta Dungeness
Evangelistas
Bahia Felix
Punta Arenas
Bahia Harris
Ushuaia
New Year Island
St. John Harbor
STATEN I.
FALKLAND IS.
Cape Pembroke
San Salvador
Mision Englesa
Itacurubi del Rosario
Kilometer 182
Asuncion
Puerto Bertoni
Formosa
Villa Rica
Corrientes
Posadas
Goya
Paso de los Libres
Curuzu
Zanja Honda
Santa Anna do Livramento
Concordia
Santa Fe
San Francisco
Melo
Concepcion del Uruguay
Rosario
San Jorge
Fray Bentos
Santa Victoria do Palmar
Junin
Buenos Aires
Montevideo
Rocha
Tranque Lauquen
Victorica
Dolores
Azul
General Acha
Mar del Plata
Tres Arroyos
Bahia Blanca
Choele Choel
Valcheta
San Antonio
Patagones
Puerto Madryn
Rawson
Camarones
SCALE OF MILES
0 25 50 100 150 200

TABLE 1.—*Elevation of stations*

Stations	Elevation in feet	Stations	Elevation in feet
Paraguay		*Argentina*	
Asuncion	305	Azul	446
Mision Inglesa	361	Bahia Blanca	82
Puerto Bertoni	515	Bariloche	2,579
Uruguay		Buenos Aires (Chacarita)	82
Minas	392	Catamarca	1,673
Montevideo (Prado)	82	Ceres	285
Rocha	105	Choele Choel	456
San Fructuoso	449	Chos Malal	2,644
San Jorge	400	Cipolletti	880
Santa Anna do Livramento [1]	689	Colonia 16 de Octubre	1,827
Santa Victoria do Palmar [1]	16	Colonia Sarmiento	899
Chile		Concepcion del Uruguay	46
Antofagasta	16	Concordia	79
Arica	16	Cordoba	1,388
Bahia Felix	49	Corrientes	177
Bahia Harris	39	Formosa	194
Cabo Raper	131	General Acha	715
Caldera	92	Goya	85
Casapangue	1,050	Humuhuaca	9,925
Chillan	374	Jachal	3,950
Combarbala	3,494	Jujuy	4,167
Concepcion	49	Junin	259
Contulmo	164	Las Lajas	2,339
Copiapo	1,214	La Quiaca	11,358
El Teniente	6,801	La Rioja	1,676
Evanjelistas	180	Malargue	4,659
Iquique	30	Mar del Plata	82
Isla Guafo	459	Mendoza	2,477
Isla Mocha	66	New Year Island	164
La Pampa	3,937	Oran	1,181
Los Andes	2,680	Paso de los Libres	194
Los Guindos	1,444	Patagones	105
Lonquimay	3,182	Posadas	453
Melinka	16	Puente del Inca	8,948
Ollague	12,123	Puerto Madryn	46
Ovalle	820	Rio Cuarto	1,444
Panguipulli	459	Rivadavia	682
Potrerillos	2,789	Rosario	85
Puerto Montt	328	Salta	3,865
Punta Angeles (Valparaiso)	134	San Antonio	95
Punta Arenas	92	San Juan	2,178
Punta Carranza	98	San Luis	2,323
Punta Corona (Ancud)	157	Santa Cruz	39
Punta Dungeness	16	Santa Fe	85
Punta Lavapie	151	Santiago del Estero	613
Punta Tortuga (Coquimbo)	89	Staten Island	39
Punta Tumbes	299	Tinogasta	4,653
Refresco	6,070	Trenque Lauquen	328
San Fernando	1,148	Tres Arroyos	354
Santiago	1,706	Tucuman	1,466
Tacna	1,837	Ushuaia	39
Talca	322	Valcheta	636
Temuco	367	Victorica	1,027
Valdivia	30		

[1] In Brazil.

In summer the contrast between northern stations is mainly due, of course, to difference in exposure—continental as against maritime. It is to be noted, however, that the cold Peruvian current immediately off the western coast chills the waters and the westerly winds to such an extent that the stations on the Chilean coast have temperatures much below those normal for latitude and thus intensifies the contrast.

In the south in this same season the almost uninterrupted winds sweeping in from the cool coastal waters lose the greater part of their vapor content as they rise over the mountains; they probably undergo some adiabatic heating as they descend to the eastern plains, where they are further warmed during passage over the dry "rain shadow" to the Atlantic coast.

From summer to winter there is a very considerable fall in temperature over the northeastern lowland, but in this interval the cooling effect of the western waters has likewise increased and the contrast, much modified, remains for the northern stations.

Southward from about latitude 45° the winter difference between temperatures on opposite coasts is small. In June the mean temperature for Bahia Blanca is 2.2° above that for Valdivia, but farther south the eastern coast is somewhat cooler than the western due to the chilling of the prevailing westerly winds in their passage over the now strongly cooled land.

In view of the recurrence of inquiry relative to compraative temperatures at equal latitudes in South America and North America, the data in Table 4 will probably prove interesting and instructive.

On the Atlantic coast the South American stations have much higher temperatures in winter, the difference increasing from 5° for latitude 35° to 35° for latitude 55°, but they have nearly the same temperatures in summer; on the Pacific coast, on the contrary, the South American stations have, as a rule, lower temperatures in both winter and summer, with greatest contrast in low latitudes (Antofagasta—Mazatlan, 14°). In the interior at middle latitude South America contrasts with North America in being moderately cooler in summer and considerably warmer in winter (Cipolletti—Kansas City, 14°).

The outstanding contrasts in Table 4 are due to the narrow width of the southern continent which does not permit the full development of the continental type of climate, especially as regards cooling in winter, found in the far wider northern continent, and also to powerful cooling effects of two ocean streams, the Labrador and Peruvian currents.

Precipitation.—In Table 5, where selected stations in the several countries are arranged in the order of the amount of annual precipitation, we find the variation in yearly totals rather moderate in the small Republics of Paraguay and Uruguay, considerable in Argentina (extremes: San Juan, 3 inches and Posadas, 59 inches) and phenomenal in Chile (extremes; Arica, 0.02 inch and Bahia Felix, 200 inches).

East of the Andes the heaviest annual rainfall (70 inches) is found in eastern Paraguay at Puerto Bertoni; in all directions from that point there is a gradual decrease, with amounts falling to less than 10 inches (locally to less than 5 inches) in a narrow strip of territory from Humuhuaca to Las Lajas and over practically all of the area south of the latitude of Bahia Blanca.

West of the Andes conditions are reversed; in the north there is extreme aridity, while in the south precipitation is moderate to abundant, becoming even greatly excessive over limited regions. The desert region, that in which annual rainfall averages less than 5 inches, extends southward along the Chilean coast to Copiapo and to some distance inland. Beyond the area of gradual increase in annual total to 30 to 50 inches in the region around Concepcion there is an abrupt increase to 80 inches or more over the remainder of the coast, where under favorable local conditions the yearly means are greatly increased, for example, to 105 inches at Valdivia, 124 inches at Melinka, and 200 inches at Bahia Felix.

No data are available for extremely elevated points south of Ollague and La Quiaca, but, judging from conditions on either side of the Andes and especially from the small annual means of 0.31 inch at Refresco (6,070 feet), 4.57 inches at La Pampa (3,940 feet), and 4.14 inches at Puente del Inca (8,950 feet), it seems highly probable that precipitation is very light, perhaps not more than 10 inches, in the highest mountain regions southward nearly to the latitude of Santiago. However, at El Teniente (6,800 feet), just south of Santiago, the annual total has increased to 41 inches, and farther south at much lower levels, Los Guindos (1,450 feet) and Casapangue (1,050 feet) the yearly means are 139 and 140 inches, respectively.

Two features of rainfall distribution merit special mention; these are the extreme aridity of the northern Chilean coast and the great "rain shadow" of southern Argentina.

The arid condition of the northern Chilean coast, truly remarkable from Arica to Caldera (stations whose annual precipitation means are 0.02 and 0.59 inch, respectively), is sometimes explained by stating that the cordilleras of the Andes rear an impassable barrier to moist easterly winds. It is true that forced ascent such as air currents must undergo on the eastern slopes of the Andes would necessarily deprive them of almost all of their water-vapor content, which can not be considerable in view of the moderate to heavy rainfall precipitated from these currents over a vast area covering most of the eastern half of southern South America; but why, with prevailing southwest (ocean) winds, moderately high relative humidity and cloudiness (see Tables 20, 16, and 17), does this coast and the interior even to considerable elevations remain one of the most outstanding regions of deficient rainfall to be found here and there over the surface of the earth?

The cause of this precipitation anomaly, which is coincident with the temperature anomaly previously noted, is to be found in the cold waters transported far northward by the Peruvian current, one of the ocean streams referred to by Julius Hann [1] in the following statement:

> Cool, ocean currents flowing from higher to lower latitudes diminish precipitation in their vicinity since the moist air over them has a temperature lower than that corresponding to the latitude. The air is warmed over the land and thereby the saturation deficit is increased. In addition, these cool currents are accompanied by winds blowing in the same direction, from higher to lower latitudes, which thus at the same time have a tendency to reduce rainfall rather than to produce it.
>
> The cool ocean currents of the inner subtropical and tropical circulation on the eastern side of oceanic areas of pressure maximum cause striking deficiency in rainfall on the continental coasts washed by them. This is most marked on the western coasts of South Africa and *South America*, which are washed by the mightiest of these cool currents. The western coast of South America north of the point where the westerly drift bends northward and flows toward lower latitudes becomes more and more arid until the extreme condition of aridity is reached in northern Chile and Peru. This is connected with the fact that the negative temperature anomaly becomes greater and greater the farther the current pushes into lower latitudes, as the temperature of the water rises very slowly. The arid region does not end until the cold current leaves the coast.
>
> Even when south and southwest winds prevailing on the coast bring moist sea air over to the land rain seldom occurs, since the land in such low latitudes is strongly heated (there is, as a matter of fact, an increase in temperature even up to a considerable elevation above sea level), and with the higher temperature of the land the cool sea air has a greater saturation deficit.

In middle Chile, from Punta Angeles to Punta Lavapie, summer conditions relative to the Peruvian current and the land area are very much similar to those prevailing throughout the year farther north, and consequently there is scant rainfall, but in winter the land undergoes much greater cooling than the sea; hence the saturation deficit of the moist ocean winds disappears and precipitation shows a marked increase in amount, with abundant supply in the months of maximum, May, June, and July.

West of the Andes from the latitude of Contulmo southward the summers are no longer dry and the winters are excessively wet; conditions are now favorable for precipitation over the land and especially at elevations in the interior. During forced ascent to the crests of the southern Andes the westerly winds undergo such depletion of their water-vapor content that they are dry when they reach the eastern, leeward side. The mountains can, therefore, be looked upon as casting a great "rain shadow" over southern Argentina.

[1] Handbuch der Klimatologie (third edition), Vol. I, p. 175.

The striking contrast between conditions without and within the "rain shadow" are set forth by the annual means of precipitation (in inches) for several pairs of stations, more or less adjacent, as follows: Los Guindos, 139, and Chos Malal, 9; Panguipulli, 104, and Junin de los Andes, 18; Casapangue, 140, and Maquinchao, 8; Melinka, 124, and Colonia Sarmiento, 8; Cabo Raper, 81, and La Madrugada, 8; Bahia Felix, 200, and Punta Arenas, 19.

Winds.—Summarization of tabular wind data presented and discussed later in connection with other climatic data for the several countries taken separately will not be attempted here; reference to positions and influences of "centers of action" will, it is thought, be of more interest and value, and will incidentally touch upon the principal features of wind circulation.

Relative to Argentina, W. G. Davis writes: [2]

> As regards the atmospheric circulation, the Republic may be divided into two general systems. In the section to the north of the territory of Rio Negro, where the continent begins to widen from east to west, the continental or cyclonic movement is found; while to the south of the Rio Negro the circulation corresponds to the Antarctic or anticyclonic movement. These two divisions may be designated, respectively, as continental and Antarctic.
>
> The region of the continental circulation lies between two permanent high-pressure areas, one in the Atlantic [3] and the other in the Pacific, the former being farther from the continent than the latter; so that the greatest depression between these two HIGHS is found, on the mean of the year, in the interior of the continent, and in summer the dividing line is represented by a narrow area of low pressure extending from north to south at the foot of the Cordilleras. In this region of continental circulation high and low pressure areas are formed, exercising their respective influences on the climate. In theAntarctic division, to the south of 42° south latitude, the general movement of the air is much more constant, the isobars are parallel, running east and west, and the prevailing wind is westerly. It is but seldom that cyclonic areas form over the comparatively limited extension of land in this region.[4]

"The climate of Chile," writes R. C. Mossman,[5] "apart from oceanic effects, is largely governed by the position and intensity of the South Pacific anticyclone central to the west of Juan Fernandez, and a corresponding low-pressure area in the far south located about the latitude of the Antarctic Circle, some distance to the west of Grahams Land."

As a supplement to the above brief statement there will be quoted two paragraphs on wind conditions on the Chilean coast by Dr. J. Hann.[6]

> The permanent barometric maximum off the middle coast of Chile determines the prevailing winds, which are southwest in the north and west in the south. The yearly shifting of the maximum determines the yearly march of the prevailing winds.
>
> In January and February the axis of the area of high pressure (30.22 inches) lies in latitude 35° S. In July and August it moves to 30° S. Consequently, west winds are first met in January and February in latitude 42° S. (north of this latitude southwest winds prevail), but in July and August we find them in latitude 35° S., the west wind belt south of the barometric maximum having advanced nearly 10° toward the north. That part of the coast which lies north of 25°–30° has the barometric maximum always to the south. Toward the south the pressure fall is great; in latitude 55° S. we find the isobar of 29.53 inches (in summer the pressure in latitude 35° is 30.22 inches, while that in latitude 55° is 29.23 inches). This explains the constant, strong west winds south of latitude 40°.

[2] Climate of the Republic of Argentina. Buenos Aires. 1909.

[3] This center of action has considerable influence in causing easterly wind movement over much of the littoral and mediterranean regions of Argentina.

[4] Following this the author gives a classification of types of pressure areas, HIGHS and LOWS, with movements and effects upon the weather.

[5] The Climate of Chile. Quarterly Journal of the Scottish Meteorological Society. November, 1911. Edinburgh.

[6] Handbuch der Klimatologie (third edition), Vol. III, p. 556.

TABLE 2.—*Mean monthly and annual temperatures (°F.) at selected stations in southern South America*

Station	Country	Latitude south	Elevation in feet	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
		° ′															
Mision Inglesa	Paraguay	23 23	361	6	83.2	82.7	80.4	74.8	69.5	66.4	67.2	68.5	72.8	75.6	78.8	81.2	75.1
Rivadavia	Argentina	24 12	682	8	86.4	84.0	80.2	75.0	68.6	60.6	60.9	66.2	74.1	76.8	82.4	86.0	75.1
Asuncion	Paraguay	25 32	305	20	82.0	82.2	79.9	73.2	67.0	63.6	65.6	67.0	70.4	73.8	77.3	80.8	73.6
Corrientes	Argentina	27 27	177	39	81.6	81.2	78.9	71.6	65.6	61.6	62.0	62.8	67.4	71.2	76.0	80.0	71.7
Ceres	do	29 55	285	16	78.8	77.8	74.6	67.6	61.4	56.5	55.6	56.4	62.7	67.8	72.6	76.2	67.3
Tucuman	do	26 50	1,466	40	77.6	76.4	72.8	66.8	60.5	55.5	55.3	57.2	64.8	69.7	73.0	75.3	67.1
Tacna	Chile	18 00	1,837	5	73.4	74.0	71.6	68.6	64.4	60.4	59.3	60.0	61.7	64.4	66.7	70.0	66.2
Concepcion del Uruguay	Argentina	32 30	46	11	78.4	77.8	74.0	66.2	58.6	54.2	52.8	54.8	59.7	64.8	70.0	75.0	65.5
Iquique	Chile	20 12	30	13	69.4	69.2	67.2	64.5	62.2	60.6	59.4	59.8	61.0	63.2	65.6	67.6	64.1
Santa Anna do Livramento	Brazil	30 53	689	7	74.6	72.6	68.6	66.4	60.1	53.8	55.7	54.9	59.1	63.0	67.2	72.0	64.0
Cordoba	Argentina	31 25	1,388	41	73.8	73.2	69.4	62.7	56.6	51.0	51.7	54.2	58.8	63.6	68.4	72.2	63.0
Buenos Aires	do	34 36	82	13	74.1	72.4	69.1	62.8	55.4	48.8	48.8	51.1	55.3	59.2	65.3	71.0	61.1
Montevideo	Uruguay	34 52	82	10	72.4	72.0	66.6	62.8	55.6	49.9	50.0	51.4	54.6	58.6	64.6	69.8	60.7
Caldera	Chile	27 03	92	13	66.1	66.4	64.2	60.8	58.2	55.4	54.7	55.2	56.6	58.9	61.8	64.5	60.2
Patagones	Argentina	40 48	105	15	73.0	69.9	67.4	60.2	52.4	47.2	46.2	48.2	53.6	58.8	64.8	69.9	59.3
Santiago	Chile	33 27	1,706	14	69.3	68.2	64.6	59.2	53.2	47.6	48.1	50.5	53.5	58.3	63.4	67.3	58.6
Cipolletti	Argentina	38 56	889	9	72.6	69.2	64.2	55.7	48.2	42.0	41.8	45.8	51.4	56.8	64.6	68.7	56.8
Punta Lavapie	Chile	37 08	151	12	61.4	60.6	59.3	56.6	54.2	51.2	50.8	50.6	51.4	53.8	56.0	58.8	55.4
Valdivia	do	39 48	30	11	62.3	61.1	58.8	53.8	50.0	46.0	46.2	45.8	48.6	53.0	55.0	59.1	53.4
Malargue	Argentina	35 24	4,659	8	66.2	64.3	59.2	53.8	45.6	36.7	37.0	40.8	45.8	51.0	58.4	63.8	51.9
Colonia Sarmiento	do	45 30	899	8	64.8	64.2	58.6	51.9	45.0	38.6	37.4	42.0	46.6	52.6	57.4	61.2	51.7
Punta Corona	Chile	41 47	157	14	56.6	55.8	54.7	51.6	48.6	46.6	46.0	45.8	46.8	49.4	51.0	54.0	50.6
La Quiaca	Argentina	22 10	11,358	11	55.3	55.9	54.5	50.2	42.6	38.2	37.8	42.2	47.6	51.6	54.8	56.5	48.9
Santa Cruz	do	52 22	39	9	59.4	57.9	54.8	47.1	40.6	35.4	35.6	38.5	44.6	49.6	53.4	56.8	47.8
Lonquimay	Chile	38 26	3,182	9	58.2	57.1	53.6	48.0	42.7	34.9	34.6	37.6	42.8	49.0	51.5	55.2	47.1
Puente del Inca	Argentina	32 48	8,948	7	55.2	53.9	51.4	45.9	41.4	32.2	32.3	34.8	38.3	43.4	48.1	51.4	44.0
Punta Arenas	Chile	53 10	92	14	52.6	51.4	49.0	43.6	38.9	35.8	35.4	36.2	40.8	45.3	47.2	50.8	43.9
Ushuaia	Argentina	54 50	39	6	48.6	48.4	45.5	40.0	35.5	30.6	30.8	33.6	38.6	42.6	44.8	46.4	40.4

TABLE 3.—*Mean monthly and annual temperatures (°F.) at contrasted eastern and western stations of southern South America*

Station	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mision Inglesa	83.2	82.7	80.4	74.8	69.5	66.4	67.2	68.5	72.8	75.6	78.8	81.2	75.1
Antofagasta	69.5	69.8	67.8	64.4	62.0	58.0	56.7	57.4	58.8	60.9	63.7	66.9	63.0
Difference	13.7	12.9	12.6	10.4	7.5	8.4	10.5	11.1	14.0	14.7	15.1	14.3	12.1
Corrientes	81.6	81.2	78.9	71.6	65.6	61.6	62.0	62.8	67.4	71.2	76.0	80.0	71.7
Caldera	66.1	66.4	64.2	60.8	58.2	55.4	54.7	55.2	56.6	58.9	61.8	64.5	60.2
Difference	15.5	14.8	14.7	10.8	7.4	6.2	7.3	7.6	10.8	12.3	14.2	15.5	11.5
Paso de los Libres	79.9	80.4	77.6	68.9	62.2	58.4	58.8	59.1	64.2	68.1	73.8	77.4	69.1
Punta Tortuga	63.4	63.5	61.6	58.4	56.6	54.2	53.2	53.9	55.0	56.5	58.8	61.3	58.0
Difference	16.5	16.9	16.0	10.5	5.6	4.2	5.6	5.2	9.2	11.6	15.0	16.1	11.1
Bahia Blanca	74.8	71.2	68.1	60.6	53.2	48.2	48.0	49.6	54.6	59.2	66.2	71.5	60.4
Valdivia	62.3	61.1	58.8	53.8	50.0	46.0	46.2	46.8	48.6	53.0	55.0	59.1	53.4
Difference	12.5	10.1	9.3	6.4	3.2	2.2	1.8	2.8	6.0	6.2	11.2	12.4	7.0
Puerto Madryn	68.8	69.4	64.0	58.6	51.2	44.9	44.5	47.0	50.8	55.0	59.8	66.3	56.7
Punta Corona	56.6	55.8	54.7	51.6	48.6	46.6	46.0	45.8	46.8	49.4	51.0	54.0	50.6
Difference	12.2	13.6	9.3	7.0	2.6	−1.7	−1.5	1.2	4.0	5.6	8.8	12.3	6.1
Punta Dungeness	53.0	52.8	50.8	45.7	41.6	38.4	37.4	37.8	40.6	44.6	47.0	50.8	45.0
Evanjelistas	47.0	47.1	46.9	44.7	42.4	40.3	39.3	39.6	40.4	42.2	43.0	45.2	43.2
Difference	6.0	5.7	3.9	1.0	−0.8	−1.9	−1.9	−1.8	0.2	2.4	4.0	5.6	1.8

TABLE 4.—*Extreme monthly mean temperatures (°F.) at contrasted stations in South America and North America, paired according to location and latitude*

Station	Latitude	Elevation in feet	Highest monthly mean	Month	Lowest monthly mean	Month
Atlantic coast						
Buenos Aires	35° S.	82	74.4	January	51.2	July.
Wilmington, N. C	34° N.	78	79.1	July	46.5	January.
Bahia Blanca	39° S.	82	74.8	January	48.0	July.
Atlantic City, N. J	39° N.	52	72.5	August	32.5	January.
Deseado	48° S.		61.4	January	39.0	July.
St. Johns, N. F	48° N.	125	59.8	August	22.5	February
Ushuaia	55° S.	39	48.6	January	30.6	June.
Hopedale, Lab	55° N.	26	50.4	August	−4.9	January.
Pacific coast						
Antofagasta	24° S.	16	69.8	February	56.7	July.
Mazatlan, Mex	23° N.	25	83.1	August	69.1	February.
Punta Angeles	33° S.	134	64.4	January	53.1	July.
San Diego, Calif	33° N.	87	68.7	August	54.3	January.
Valdivia	40° S.	30	62.3	January	46.0	June.
San Francisco, Calif	38° N.	155	60.9	September	49.9	January.
Melinka	44° S.	16	56.0	February	45.2	August.
Seattle, Wash	48° N.	125	63.1	August	39.5	January.
Evanjelistas	52° S.	180	47.1	February	39.3	July.
Massett, Q. C. I	54° N.	10	58.2	August	35.3	January.
Interior						
Cipolletti	39° S.	889	72.6	January	41.8	July.
Kansas City, Mo	39° N.	963	78.1	July	28.2	January.
Cincinnati, Ohio	39° N.	628	75.1	do	30.3	Do.

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TABLE 5.—*Mean monthly and annual precipitation (in inches) at selected stations in southern South America*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Paraguay														
Mision Inglesa	29	6.07	4.80	5.11	4.44	3.61	3.29	1.55	0.76	2.15	4.48	5.56	5.01	46.83
Asuncion	40	5.92	4.93	5.27	5.74	4.85	2.88	2.38	1.63	3.40	5.87	5.63	6.11	54.61
Villa Rica	27	4.96	4.63	6.10	6.12	5.34	4.68	3.09	2.96	4.63	5.87	6.47	5.85	60.70
Puerto Bertoni	13	6.39	5.77	5.33	6.59	5.80	6.04	3.35	4.43	6.89	5.88	7.63	6.04	70.14
Uruguay														
Montevideo	20	2.77	2.82	3.21	4.62	3.84	2.72	2.52	3.06	3.36	2.46	3.21	3.40	37.99
San Jorge	23	3.72	2.15	4.41	4.56	3.03	2.84	3.45	3.87	2.82	3.67	2.93	3.45	40.90
San Fructuoso	22	2.70	3.07	4.77	4.36	4.58	3.24	4.23	3.97	4.54	3.35	3.93	4.16	46.90
Santa Anna do Livramento [1]	7	4.52	4.10	6.22	4.25	5.61	3.31	4.62	3.79	4.98	3.83	3.73	3.92	52.88
Chile														
Arica	17	0.02	T.	0.00	0.00	0.00	T.	T.	T.	0.00	T.	T.	0.00	0.02
Iquique	25	T.	T.	T.	T.	T.	T.	0.03	0.01	0.01	T.	T.	0.00	0.05
Antofagasta	16	0.00	0.00	T.	T.	0.01	0.02	0.04	0.01	0.02	0.02	0.03	0.01	0.16
Caldera	25	0.01	T.	T.	T.	0.14	0.13	0.15	0.08	0.03	0.02	0.02	0.01	0.59
Ollague	5	0.80	0.98	0.06	0.00	0.00	0.00	0.00	0.02	0.04	T.	0.24	0.20	2.34
Punta Tortuga	25	T.	T.	0.06	0.03	1.15	1.54	1.16	0.55	0.15	0.02	0.04	0.01	4.71
Combarbala	6	0.00	0.00	0.02	0.03	1.62	2.37	2.28	1.41	0.25	0.00	0.00	0.00	7.98
Punta Dungeness	21	1.05	0.69	0.84	1.00	0.78	0.67	0.80	0.59	0.43	0.38	0.45	1.05	8.73
Santiago	58	0.03	0.06	0.19	0.57	2.44	3.29	3.11	2.17	1.23	0.54	0.26	0.20	14.09
Punta Arenas	20	1.26	1.02	1.59	2.03	2.59	1.78	2.13	1.51	1.50	0.85	1.28	1.32	18.86
Punta Angeles	32	0.01	0.01	0.37	0.50	4.29	5.70	4.00	2.70	1.22	0.44	0.33	0.11	19.68
Talca	15	0.16	0.15	0.57	1.64	6.72	6.50	5.02	3.20	2.05	0.82	0.96	0.25	28.04
Bahia Harris	10	2.48	3.00	3.43	3.41	3.68	2.70	2.94	2.61	2.32	1.29	2.26	2.83	32.96
Chillan	11	0.39	0.51	1.58	2.32	7.85	8.24	6.54	5.30	3.46	1.41	1.80	0.77	40.17
Concepcion	45	0.69	0.84	2.40	3.32	7.78	9.81	9.80	7.28	4.00	2.27	1.81	1.03	51.03
Lonquimay	11	1.54	1.78	4.28	5.30	13.27	10.29	11.72	10.07	6.23	2.46	4.54	2.38	73.86
Cabo Raper	12	6.18	6.34	6.66	8.06	7.39	6.43	6.73	7.73	6.74	5.42	6.51	6.41	80.69
Puerto Montt	40	4.73	4.10	6.27	7.56	11.21	9.53	10.70	9.43	6.22	5.28	5.48	5.56	86.07
Valdivia	52	2.46	2.80	5.63	9.17	15.53	16.94	16.63	13.38	8.22	5.28	4.88	4.21	105.13
Evanjelistas	26	11.78	9.59	11.43	11.16	9.61	9.31	9.56	8.59	9.35	8.88	9.91	10.16	119.33
Melinka	11	5.99	6.62	8.54	10.63	13.76	14.48	15.06	12.80	10.11	7.54	9.72	9.68	124.93
Los Guindos	7	3.30	2.96	8.76	9.80	26.76	20.11	21.74	17.54	8.60	6.45	9.89	3.20	139.11
Bahia Felix	12	17.64	17.98	18.77	18.89	17.04	14.46	16.34	13.63	16.46	13.26	18.14	17.72	200.33
Argentina														
San Juan		0.79	0.71	0.43	0.08	0.04	0.04	0.28	0.12	0.12	0.24	0.24	0.39	3.48
Tinogasta	10	1.54	1.87	0.83	0.16	0.12	0.00	0.00	0.00	0.00	0.00	0.32	0.51	4.35
Humahuaca	11	1.69	1.22	0.87	0.12	0.00	0.00	0.00	0.00	0.00	0.47	0.83	0.91	6.11
Deseado	8	0.59	0.51	0.28	0.71	1.61	0.59	1.30	0.51	0.12	0.32	0.16	0.47	7.17
Mendoza		0.87	1.18	1.10	0.47	0.39	0.35	0.24	0.32	0.51	0.75	0.71	0.75	7.64
Chos Malal		0.32	0.28	0.24	0.55	1.97	1.97	0.91	1.18	0.55	0.35	0.47	0.32	9.11
La Quiaca		3.27	2.36	2.01	0.28	0.00	0.00	0.04	0.00	0.00	0.20	1.06	2.13	11.35
Catamarca		2.64	2.44	2.20	0.59	0.47	0.20	0.08	0.32	0.35	0.87	1.18	1.93	13.27
Ushuaia		1.77	1.93	1.69	1.81	1.57	1.54	1.26	0.91	1.18	1.50	1.89	1.80	18.85
Bahia Blanca		2.20	2.24	2.24	3.46	1.14	0.63	0.91	0.71	1.65	2.48	1.81	2.05	21.52
Cordoba		4.17	4.32	3.50	1.68	0.99	0.28	0.33	0.51	0.90	2.38	4.02	4.65	27.73
Jujuy		6.67	5.12	5.63	1.26	0.51	0.16	0.16	0.12	0.35	1.54	2.56	5.20	29.26
Rio Cuarto		4.06	3.42	3.86	2.36	1.18	0.32	0.47	0.79	1.10	3.39	4.21	4.88	30.04
Rosario		2.99	2.76	3.46	4.33	1.77	1.22	1.42	1.38	2.20	3.82	4.21	3.98	33.54
Buenos Aires		3.11	2.60	3.94	4.72	2.83	2.01	2.16	2.24	2.87	3.35	3.94	4.09	37.86
Bariloche		1.42	0.83	2.20	3.54	8.23	5.67	4.92	5.00	2.72	1.46	1.85	1.18	39.02
Corrientes		4.21	4.33	6.02	5.59	4.02	0.77	2.05	1.57	2.72	5.04	5.24	5.87	48.43
Formosa		4.09	5.12	5.63	5.75	3.70	2.76	1.85	1.38	2.91	6.42	7.28	6.50	53.39
Paso de los Libres		3.94	4.84	5.79	6.73	5.59	4.06	3.27	3.19	4.88	5.98	4.88	5.12	58.27
Posadas		4.61	5.24	5.35	6.06	4.96	4.92	4.53	3.27	3.58	5.91	5.24	5.04	58.71

[1] In Brazil.

CLIMATIC CONDITIONS IN THE SEVERAL SUBDIVISIONS

Meteorological data in greater detail follow for the four continental divisions of southern South America, Paraguay, Uruguay, Chile, and Argentina, and also for some adjacent areas, Juan Fernandez Islands, Falkland Islands, South Georgia, and South Orkney Islands.

PARAGUAY

The general level of the lowlands in the west and of the Chaco (west of the Paraguay River) may be taken as 250 to 300 feet above the sea; eastern Paraguay is much higher, yet it is not, by any means, a mountainous country, but in contrast with the monotonously level pampas of Argentina its diversified surface may well seem so. No part of this region appears to be higher than 2,000 feet.[7]

[7] Paraguay (second edition). International Bureau of American Republics. Washington. 1902.

The data presented here for stations representing all except the highest regions are taken almost entirely from the works of W. G. Davis, published in 1902, 1910, and 1914 by the Oficina Meteorológica Argentina, Buenos Aires.

The highest mean annual temperature is 75° at Mision Inglesa (361 feet), in the Gran Chaco, and the lowest is 71° at Puerto Bertoni (515 feet), on the eastern border. There is considerable change in temperature from summer to winter; at the first of the stations just named the mean for January and February is 83°, while that for June is 66°, and at the second the values are 79° for the midsummer months and 61° for July. Temperatures of about 110° have been recorded in all regions and are rather frequent at Mision Inglesa, where temperatures of 100° or above have probably been recorded in all months of the year. Readings of 32° or slightly lower have been noted at all stations except Asuncion.

TABLE 6.—*Temperature data (°F.), Paraguay* [1]

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean maximum temperature														
Mision Inglesa	6	95.9	94.5	91.6	86.2	81.1	77.0	79.3	82.0	86.0	88.7	91.0	93.4	87.2
Itacurubi del Rosario, 2 p. m.	7	88.0	87.6	86.7	81.1	74.7	70.5	73.8	76.3	78.8	82.8	85.1	89.4	81.2
Asuncion	20	92.8	93.2	90.5	82.6	76.3	72.3	74.7	77.4	80.8	84.6	88.2	92.3	83.8
Puerto Bertoni	4	93.2	90.9	89.2	82.9	77.2	72.7	73.0	72.3	79.2	85.5	88.7	92.8	83.1
Mean minimum temperature														
Mision Inglesa	6	70.5	70.9	69.3	63.5	57.9	55.8	55.2	55.0	59.5	62.6	66.7	68.9	63.0
Itacurubi del Rosario, 7 a. m.	7	77.7	76.3	73.9	67.3	60.6	57.2	58.8	60.6	62.2	68.9	73.4	77.0	67.8
Asuncion	20	71.1	71.2	69.3	63.7	57.6	55.0	56.5	56.7	59.9	63.1	66.4	69.4	63.3
Puerto Bertoni	4	65.7	68.0	64.2	60.8	54.7	51.6	48.7	51.8	53.6	56.7	62.4	64.0	58.5
Mean temperature (maximum+minimum÷2)														
Mision Inglesa	6	83.2	82.7	80.4	74.8	69.5	66.4	67.2	68.5	72.8	75.6	78.8	81.2	75.1
Asuncion [2]	20	82.0	82.2	79.9	73.2	67.0	63.6	65.6	67.0	70.4	73.8	77.3	80.8	73.6
Puerto Bertoni	4	79.4	79.4	76.7	71.8	66.0	62.2	60.8	62.0	66.4	71.1	75.6	78.4	70.8
Mean temperature (7 a. m.+2 p. m.+9 p. m.÷3)														
Mision Inglesa	6	83.7	83.5	80.6	74.7	70.3	66.4	68.0	71.1	72.9	76.6	78.6	82.2	75.7
Itacurubi del Rosario	7	80.2	79.5	77.8	72.2	66.1	62.5	64.6	66.8	68.4	73.5	76.5	80.3	72.4
Asuncion	20	80.4	80.6	78.3	71.8	66.0	62.4	64.0	66.7	69.8	73.0	76.5	79.7	72.6
Puerto Bertoni	4	78.1	77.7	75.6	70.2	64.0	60.6	59.7	63.3	65.5	70.2	74.1	77.4	69.7
Highest temperature														
Mision Inglesa	11	108	109	106	103	99	97	96	103	108	109	112	110	112
Itacurubi del Rosario, 2 p. m.	7	101	100	100	97	94	88	91	95	103	103	99	101	103
Asuncion	20	105	109	103	101	94	90	92	100	103	106	106	107	109
Puerto Bertoni	4	108	100	97	94	89	86	90	92	95	102	100	106	108
Lowest temperature														
Mision Inglesa	11	52	52	48	37	28	28	28	30	32	39	45	53	28
Itacurubi del Rosario, 7 a. m.	7	61	59	53	48	34	33	34	32	44	50	54	46	32
Asuncion	20	54	52	49	42	34	33	36	35	37	41	49	47	33
Puerto Bertoni	4	50	56	52	41	34	32	30	28	31	38	46	49	28

[1] Climate of the Argentine Republic (1902) and Argentine Meteorological Service-History and Organization, with a condensed summary of results (1914). Walter G. Davis.
[2] Monthly record of temperature and pressure in Smithsonian Miscellaneous Collections, vol. 79.

TABLE 7.—*Relative humidity and cloudiness data, Paraguay*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean relative humidity [1]														
Mision Inglesa [2]	5	71	71	78	77	78	80	77	73	70	72	76	73	75
Itacurubi del Rosario [3]	7	79	80	80	82	83	81	78	72	72	73	75	76	78
Asuncion [4]	9	71	71	72	76	78	77	72	68	64	64	67	66	71
Mean relative humidity, 7 a. m.														
Mision Inglesa [2]	5	82	82	88	90	92	91	90	86	83	82	84	83	86
Itacurubi del Rosario [3]	7	83	84	86	89	90	89	86	83	80	79	78	80	84
Asuncion [4]	9	81	82	84	86	89	88	84	79	76	73	74	73	81
Mean relative humidity, 2 p. m.														
Mision Inglesa [2]	5	53	54	62	58	58	64	57	55	54	56	60	55	57
Itacurubi del Rosario [3]	7	66	66	63	66	67	67	62	58	55	59	61	60	62
Asuncion [4]	9	56	55	55	59	62	61	56	53	48	50	53	50	54
Mean cloudiness [1]														
Mision Inglesa [2]	5	4.9	4.6	4.4	5.0	4.3	5.6	4.0	5.0	4.3	5.1	5.1	5.3	4.8
Itacurubi del Rosario [3]	7	5.3	4.4	3.8	4.2	4.0	4.7	3.8	4.2	3.5	4.1	4.1	4.0	4.2
Asuncion [4]	9	5.8	5.2	4.7	4.9	4.9	5.2	4.5	4.9	4.6	5.2	4.5	4.8	4.9

[1] Observations at 7 a. m., 2 p. m., and 9 p. m.
[2] Anales de la Oficina Meteorologica Argentina. Tomo XIV, p. 473.
[3] Idem, p. 402.
[4] Climate of the Argentine Republic. W. G. Davis. 1902.

From October to May, inclusive, the average monthly precipitation is over 4.50 inches and the mean for the wettest month, January, is 6.50 inches. In the driest months, July and August, the mean is over 2 inches. Precipitation is abundant and well distributed over the country and through the year; the nearest approach to a dry season is found in the amounts for the winter months of July and August in the region extending from Itacurubi del Rosario to the northwestern border, but even here in the driest month, August, the average amount of precipitation received is 1 inch. The total annual rainfall is less than 50 inches in the Gran Chaco (Mision Inglesa, 47 inches), 50 to 60 inches over the remaining area exclusive of the higher eastern section, and 70 inches at Puerto Bertoni, the only station representing the eastern region drained by the Parana River.

TABLE 8.—*Precipitation data, Paraguay*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean precipitation (in inches)														
San Salvador [1]	10	7.06	8.87	5.87	5.77	4.82	2.78	1.37	1.09	2.60	5.86	5.89	5.72	57.70
Mision Inglesa [2 3]	29	6.07	4.80	5.11	4.44	3.61	3.29	1.55	0.76	2.15	4.48	5.56	5.01	46.83
Itacurubi del Rosario [4]	7	8.83	5.73	5.01	4.02	3.68	2.98	3.06	1.22	2.27	8.18	5.89	6.17	57.04
Asuncion [2 3]	40	5.92	4.93	5.27	5.74	4.85	2.88	2.38	1.63	3.40	5.87	5.63	6.11	54.61
Villa Rica [5 6]	27	4.96	4.63	6.10	6.12	5.34	4.68	3.09	2.96	4.63	5.87	6.47	5.85	60.70
Puerto Bertoni [7]	13	6.39	5.77	5.33	6.59	5.80	6.04	3.35	4.43	6.89	5.88	7.63	6.04	70.14
Maximum precipitation in 24 hours (in inches)														
Mision Inglesa	5	5.90	2.76	1.70	3.69	1.10	4.86	2.35	1.26	5.04	2.62	3.50	3.07	5.90
Itacurubi del Rosario	7	4.58	2.94	2.95	3.29	2.30	3.69	3.02	1.54	3.52	5.28	3.68	3.54	5.28
Asuncion	8	5.24	4.33	4.79	4.38	2.70	4.59	2.93	2.11	2.02	2.52	3.37	2.60	5.24
Mean number of days with precipitation														
Mision Inglesa	11	7	7	7	6	5	4	3	2	4	6	8	7	66
Itacurubi del Rosario	7	13	10	7	6	7	7	5	5	6	9	9	9	93
Asuncion	20	8	7	7	7	7	6	5	4	6	8	8	8	81
Puerto Bertoni	4	13	11	8	7	5	8	6	8	9	9	9	8	101

[1] 1913–1922. Mss. Oficina Meteorológica Argentina.
[2] Smithsonian Miscellaneous Collections, vol. 79, p. 1138.
[3] Monthly record in Smithsonian Miscellaneous Collections, vol. 79.
[4] See footnotes preceding tables.
[5] 1877–1902 (broken). Meteorologische Zeitschrift, 1909, p. 322. 1903–1923 (broken). Smithsonian Miscellaneous Collections, vol. 79, p. 1137.
[6] Smithsonian Miscellaneous Collections, vol. 79, p. 1139.
[7] 1910–1922. Mss. Oficina Meteorológica Argentina.

TABLE 9.—*Wind, fog, and thunderstorm data, Paraguay*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Prevailing wind direction														
Mision Inglesa [1]	5	e.	e.	e.	e.	e.	s.	e.	e.	e.	e.	e.	e.	e.
Itacurubi del Rosario [1]	7	n.	ne.	e.	ne.	ne.	ne.	n.	s.	s.	s.	ne.	n.	n.
Asuncion [1]	9	s.	s.	s.	s.	s.	s.	ne.	s.	s.	s.	s.	s.	s.
Mean wind velocity, miles per hour														
Asuncion [2]	----	2.9	3.0	3.0	3.2	3.6	4.0	4.6	4.7	5.0	4.5	3.5	3.0	3.8
Mean number of days with fog														
Mision Inglesa [1]	5	1.2	1.0	0.8	2.4	2.8	3.2	2.4	2.0	1.8	1.0	2.6	1.6	22.8
Itacurubi del Rosario [1]	7	1.3	1.5	1.3	3.1	2.9	4.6	2.3	3.6	1.3	1.0	1.3	1.3	25.5
Asuncion [3]	35	2.0	0.6	2.0	4.0	6.0	7.0	4.0	5.0	2.0	1.0	0.6	0.6	34.8
Mean number of days with thunderstorm														
Mision Inglesa [1]	5	2.4	4.8	2.4	2.6	0.4	1.2	1.2	2.2	1.6	3.4	3.4	3.4	29.0
Itacurubi del Rosario [1]	7	8.4	6.3	4.7	3.3	3.8	3.3	3.0	3.0	4.3	7.6	7.6	7.1	62.4
Asuncion [3]	----	3.3	3.5	2.7	1.5	2.0	1.3	1.3	2.2	2.2	4.8	4.0	3.3	32.1

[1] See references under Table 8.
[2] Climate of the Argentine Republic. Davis. 1910.
[3] South America Pilot. Part I. Seventh edition, 1922. British Admiralty.

URUGUAY

The topography of this country is very similar to that of eastern Paraguay; the so-called mountains are to be regarded rather as hills. So here, too, the available meteorological data, covering a range of about 700 feet

in elevation, represent conditions over all except the rather limited higher areas, some of which approach the 2,000-foot level.

The climatic tables have been compiled from bulletins of the Observatorio del Prado, Instituto Nacional Físico-Climatológico and the Observatorio Central, both in Montevideo, supplemented by data from the Brazilian Boletim de Normaes, in order to extend the survey to the northern and eastern borders. Conditions in the west, along the Uruguay River, may be learned in greater detail by reference to data for stations in the littoral region of Argentina.

With its small area and lack of featured topography Uruguay presents, of course, no marked contrasts in temperature. The extreme range in mean annual temperature can be little more than 3° (64° to 61° F., extreme conditions represented by Santa Anna do Livramento, Brazil, and Montevideo). The change in mean temperature from summer to winter is about 20° (Montevideo, January and February, 72°; June and July, 50°). Maximum temperatures of 100° or above and minimum temperatures slightly below 25° have been recorded in all regions.

TABLE 10.—*Temperature data (°F.), Uruguay*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean maximum temperature														
Santa Anna do Livramento, Brazil [1]	7	86.4	82.2	79.0	76.6	69.3	62.2	64.8	65.7	69.3	74.3	79.5	84.2	74.5
San Jorge	17	85.7	84.6	81.5	72.1	64.8	59.3	59.9	63.1	66.0	70.9	78.2	83.0	72.4
Santa Victoria do Palmar, Brazil [1]	7	82.4	81.7	77.0	74.5	67.3	60.6	60.4	61.5	63.9	68.0	74.1	79.2	70.9
Montevideo [2]	10	82.6	81.7	76.6	72.3	64.2	57.7	57.9	59.2	62.8	67.8	74.8	80.4	69.8
Mean minimum temperature														
Santa Anna do Livramento [1]	7	62.8	63.1	58.3	56.1	50.9	45.3	46.6	44.1	48.9	51.8	55.0	59.9	53.6
San Jorge	17	59.5	58.0	56.6	48.9	42.9	39.7	40.3	43.0	44.5	47.9	52.8	56.9	49.2
Santa Victoria do Palmar [1]	7	62.4	63.7	59.4	58.3	52.3	44.6	45.1	45.1	49.1	50.2	55.0	58.6	53.6
Montevideo [2]	10	62.1	62.2	56.7	53.4	47.1	42.1	42.1	43.5	46.4	49.5	54.5	59.2	51.6
Mean temperature (maximum+minimum÷2)														
Santa Anna do Livramento [1]	7	74.6	72.6	68.6	66.4	60.1	53.8	55.7	54.9	59.1	63.0	67.2	72.0	64.0
San Jorge	17	72.6	71.3	69.0	60.5	53.8	49.5	50.1	53.0	55.2	59.4	65.5	70.0	60.8
Santa Victoria do Palmar [1]	7	72.4	72.7	68.2	66.4	59.8	52.6	52.8	53.3	56.5	59.1	64.6	68.9	62.3
Montevideo [2] [3]	10	72.4	72.0	66.6	62.8	55.6	49.9	50.0	51.4	54.6	58.6	64.6	69.8	60.7
Mean temperature, 24 hours														
Montevideo [3]	15	71.6	71.4	68.0	63.0	56.5	52.0	50.9	51.4	55.2	59.0	64.6	69.3	61.1
Highest temperature														
Santa Anna do Livramento [1]	7	105	97	93	99	83	82	85	89	92	96	97	101	105
San Jorge	17	102	100	99	89	86	78	80	83	92	93	98	103	103
Santa Victoria do Palmar [1]	7	101	95	94	94	86	80	80	83	82	88	97	100	101
Montevideo [2]	20	109	103	101	98	85	80	83	84	90	94	98	102	109
Montevideo [3]	19	102	96	95	90	82	74	79	82	83	85	88	95	102
Montevideo [4]	20		105											105
Lowest temperature														
Santa Anna do Livramento [1]	7	48	52	45	40	32	26	23	26	34	34	40	43	23
San Jorge	17	40	41	38	33	24	23	22	24	24	29	33	37	22
Santa Victoria do Palmar [1]	7	44	49	44	43	37	23	24	32	35	34	37	40	23
Montevideo [2]	20	46	46	40	36	29	25	26	25	28	29	38	45	25
Montevideo [3]	19	52	51	50	42	36	34	33	34	36	41	43	46	33
Montevideo [4]	20						25							25
Mean number of days with maximum temperature 95° or above														
Montevideo [3]	17	3.4	2.6	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.2	5.5
Mean number of days with minimum temperature 32° or below														
Montevideo [3]	17	0.0	0.0	0.0	0.0	0.4	1.6	2.4	1.7	0.3	0.3	0.0	0.0	6.7

[1] Boletim de normaes. Directoria de Meteorologia, Brazil. Rio de Janeiro. 1922.
[2] Observatorio del Prado, Instituto Nacional Físico-Climatológico, 1901–1920.
[3] Observatorio Central, Instituto Meteorológico Nacional, 1906–1924.
[4] Villa Colón (6 miles north of the city), 1883–1902.
[5] Monthly record of temperature and pressure in Smithsonian Miscellaneous Collections, vol. 79.

TABLE 11.—*Relative humidity and cloudiness data, Uruguay*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean relative humidity														
Montevideo: [1] 24 hours	10	69	72	75	78	82	81	82	78	79	76	70	69	76
7 a. m.	10	78	83	87	89	90	89	90	87	88	83	76	76	85
2 p. m.	10	52	57	58	62	68	68	68	64	64	61	54	52	61
Montevideo, [2] 7 a. m., 2 p. m., 9 p. m.	19	66	67	68	71	71	74	76	73	71	69	66	65	70
Mean cloudiness														
San Jorge, 9 a. m., 3 p. m.	4	3.2	2.3	3.8	4.2	4.9	6.0	5.2	5.3	5.7	5.2	4.2	3.9	4.5
Montevideo, [1] 7 a. m., 2 p. m., 9 p. m.	15	4.1	4.3	4.5	4.9	5.5	5.8	5.9	5.6	5.5	5.3	4.7	4.3	5.0
Mean daily duration on sunshine, in hours [3]														
San Jorge	4	10.8	11.4	8.6	7.5	6.1	4.7	5.5	6.5	6.8	8.1	9.8	9.9	8.0
Montevideo [3]	18	10.6	10.1	9.1	7.5	6.3	5.4	5.1	6.2	7.1	7.8	10.0	10.4	8.0

[1] Observatorio del Prado.
[2] Observatorio Central.
[3] Mean annual total, 2,905 hours at both stations.

Precipitation is rather uniformly distributed over the territory and through the year. Annual means show an increase from about 38 inches over the southern third of the area to about 46 inches in the third lying parallel to the northern border, in which the extreme local means reach 50 inches. The monthly average is highest in March (4.6 inches) and lowest in June (3.2 inches). This lighter rainfall in June is in rather marked contrast with the heavier rainfall in the remainder of the colder period from March to September, inclusive.

TABLE 12.—*Precipitation data, Uruguay*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean precipitation (in inches)														
Zanja Honda	11	4.03	3.66	4.60	6.23	4.27	2.95	2.64	2.41	3.22	4.10	4.37	4.22	46.70
Santa Anna do Livramento, Brazil [1]	7	4.52	4.10	6.22	4.25	5.61	3.31	4.62	3.79	4.98	3.83	3.73	3.92	52.88
San Fructuoso	22	2.70	3.07	4.77	4.36	4.58	3.24	4.23	3.97	4.54	3.35	3.93	4.16	46.90
Melo	17	3.37	2.55	2.65	3.33	4.32	4.36	4.69	4.87	5.20	2.66	3.55	2.87	44.42
San Jorge	23	3.72	2.15	4.41	4.56	3.03	2.84	3.45	3.87	2.82	3.67	2.93	3.45	40.90
Fray Bentos	24	3.22	3.07	4.37	4.20	3.16	2.68	2.55	2.32	3.98	3.87	3.38	4.14	40.94
Santa Victoria do Palmar, Brazil [1]	7	3.77	4.54	5.26	3.60	5.84	2.44	4.54	4.15	5.48	3.51	3.20	3.43	49.86
Rocha	9	2.71	3.37	5.78	4.40	3.86	4.13	5.57	4.95	4.28	4.19	2.83	2.89	48.96
Montevideo: Observatorio del Prado [2]	20	2.77	2.82	3.21	4.62	3.84	2.72	2.52	3.06	3.36	2.46	3.21	3.40	37.99
Observatorio Central	19	2.63	3.00	3.18	4.40	3.28	3.24	2.59	3.81	3.49	2.61	3.29	3.66	39.18
Villa Colon	38	3.08	2.63	4.06	3.98	2.95	3.04	3.06	3.10	3.16	3.08	2.88	3.06	38.08
Maximum precipitation in 24 hours (in inches)														
Zanja Honda	9	6.42	3.46	4.57	3.03	2.99	2.99	1.69	1.65	3.07	2.28	4.06	4.06	6.42
Santa Anna do Livramento [1]	7	3.42	2.64	2.70	3.66	2.64	2.91	2.60	2.52	2.68	2.58	2.78	2.57	3.66
San Fructuoso	19	3.26	2.64	4.70	3.77	3.87	2.18	4.35	2.76	4.76	3.81	5.46	4.76	5.46
Melo [3]	15	3.17	2.73	1.94	3.24	5.02	4.78	5.12	4.72	5.12	2.36	3.64	2.91	5.12
Santa Victoria do Palmar [1]	7	2.60	2.62	3.79	2.56	2.66	1.62	2.68	2.51	2.64	2.58	2.58	3.35	3.79
Rocha	9	4.02	3.15	5.04	3.15	2.56	3.23	5.12	2.36	3.23	2.87	2.36	2.58	5.12
Montevideo: Observatorio del Prado	20	3.00	2.96	5.09	4.00	5.93	6.16	4.26	3.32	3.74	2.54	2.78	3.00	6.16
Villa Colon	23	3.58	3.77	4.72	6.79	5.79	4.11	2.32	2.19	3.04	3.24	3.78	2.25	6.79
Mean number of days with 0.04 inch or more of precipitation														
Zanja Honda	9	4	4	4	5	4	2	2	3	4	3	4	4	43
Santa Anna do Livramento [1]	7	6	7	6	7	4	7	6	8	5	5	5	6	72
San Fructuoso	17	5	5	6	6	5	4	5	6	6	5	5	5	63
Melo	15	4	5	5	5	6	5	5	6	6	3	4	4	58
San Jorge [4]	12	3	4	4	4	4	4	4	5	6	4	4	4	50
Fray Bentos	21	6	6	7	6	5	5	6	6	7	7	6	7	74
Santa Victoria do Palmar [1]	7	7	7	6	7	8	7	8	6	8	7	6	6	83
Rocha	9	4	5	6	7	5	7	7	7	7	6	6	5	72
Montevideo [5]	15	6	5	6	6	7	5	6	6	6	6	6	7	72

[1] See footnote, Table 10.
[2] Monthly record in Smithsonian Miscellaneous Collections, vol. 79.
[3] The total of 38.31 inches and the maximum 24-hour amount of 16.92 inches in February, 1902, are questionable.
[4] Data for Achar, 20 miles northwest of San Jorge.
[5] Observatorio del Prado. Mean annual number of days with precipitation less than 0.04 inch, 13.

TABLE 13.—*Wind, fog, and thunderstorm data, Uruguay*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Prevailing wind direction														
Santa Anna do Livramento, Brazil [1]	7	ne.	se.	ne.	ne.	s.	s.	s.	s.	se.	se.	ne.	s.	s.
San Jorge	10	e.	e, s.	ne,e.	s.	w.	ne.	ne.	ne.	ne.	e,ne.	ne.	ne.	ne.
Santa Victoria do Palmar, Brazil [1]	7	ne.	ne.	ne.	ne.	ne.	ne.	sw.	ne.	ne.	ne.	ne.	ne.	ne.
Montevideo [2]	15	e.	e.	e.	n.	n.	n.	n.	n.	e.	e.	e.	e.	e.
Mean wind velocity														
Santa Anna do Livramento [1]	5	3.1	2.7	3.1	2.9	3.4	3.6	3.8	5.8	4.3	4.5	4.5	3.8	3.8
Santa Victoria do Palmar [1]	7	12.3	11.4	11.6	11.2	10.5	11.2	10.7	12.8	13.6	13.6	13.0	13.4	12.1
Montevideo [3]	15	8.3	8.3	7.2	7.8	7.2	7.8	8.3	9.2	8.9	9.2	8.9	9.2	8.4
Mean number of days with wind velocity 25 miles per hour or higher														
Montevideo [3]	15	2.9	3.5	1.9	3.3	2.6	3.0	4.0	5.8	3.8	5.0	3.5	4.7	44.0
Mean number of days with fog														
Santa Anna do Livramento [1]	7	0.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	1.0	0.0	0.0	0.0	9.0
Santa Victoria do Palmar [1]	7	1.0	1.0	2.0	4.0	7.0	5.0	7.0	5.0	4.0	2.0	0.0	0.0	38.0
Montevideo [3]	19	0.5	0.3	1.6	3.3	6.6	9.0	10.2	6.6	4.8	2.7	1.0	0.4	47.0
Mean number of days with thunderstorm														
Santa Anna do Livramento [1]	5	3	3	5	3	2	3	2	4	4	4	3	6	47
San Jorge	4	3	1	4	3	3	4	3	6	5	4	4	4	48
Santa Victoria do Palmar [1]	7	5	4	3	3	3	3	4	2	4	2	4	4	41
Montevideo [3]	19	4	3	3	3	3	2	2	3	3	2	4	5	37

[1] See footnote under Table 10. [2] Observatorio del Prado. [3] Observatorio Central.

CHILE

This ribbonlike country, extending from 18° to 56° south latitude, is nearly 2,700 miles long while its mainland width varies between 50 and 225 miles. North of latitude 30° lies an elevated arid region, occupied in part by the Desert of Atacama. In striking contrast to this there stretches southward to the Gulf of Ancud, in latitude 41°, the Vale of Chile, a fertile, well-watered valley or plain, shut in by the lofty Andes on the east and the maritime range bordering the sea. South of the Gulf of Ancud nearly all of the territory is mountainous and inhospitable, with few scattered settlements.

The Anuario Meterológico issued by the Instituto Central Meteorológico y Geofísico de Chile, Santiago, provides data sufficient for the preparation of extensive climatic tables. In R. C. Mossman's paper, The Climate of Chile, published in the Journal of the Scottish Meterological Society, 1910, data are given for only a very few inland stations. In recent years there has been remarkable progress in the extension of the network of stations, so that it is now possible to obtain a general survey of climatic conditions.

Temperature.—From north to south over nearly equal distances along the coast the mean annual temperature decreases as follows: Arica, 64° F.; Caldera, 60°; Punta Angeles (Valparaiso), 59°; Punta Corona (Ancud), 51°; and Evanjelistas, 43°, the lowest for the whole area. In the central valley the corresponding values are: Ovalle (820 feet), 62°; Talca (322 feet), 58°; and Temuco (367 feet), 54°. Ollague, the highest station, situated within the Tropics at an elevation of 12,123 feet, has an annual mean of 48°; Refresco, at 6,070 feet, 62°; El Teniente, at 6,800 feet, 49°; and Lonquimay, much farther south, at 3,182 feet, 49°.

The change in mean temperature from January-February to June-July is generally 16° or less, but 20° to 25° at some of the elevated stations. The change is about 10° at coast stations from Arica (18° S.) to Evanjelistas (52° S.). How nearly these conditions agree with those in southern California is shown by the following differences between extreme months: Los Angeles, 16°, and San Francisco, 11°.

Mean daily range in temperature is uniformly small throughout the year in all coast regions, the annual value varying between 15° at Punta Angeles and 7° at Evanjelistas, where the influence of marked cloudiness and high frequency of precipitation is greatest. In the interior, on the contrary, the annual average daily range is generally 25° or more (maximum 35° at Refresco), with little seasonal change in the dry regions but with marked change at higher southern stations where the summer is dry and the winter wet (Lonquimay, February 38° and June 16°.)

Maximum temperatures of 97° to 100° have been recorded at many interior stations from Tacna southward to Temuco and Lonquimay. Temperatures of 95° or more are extremely rare at coast stations, having been observed only at Punta Tumbes (101°), Punta Lavapie (96°), and Valdivia (95°). These high temperatures on the coast are to be ascribed to winds causing marked föhn effect, as noted by Mossmann (loc. cit.). Table 14 is of interest in that it shows changed temperature conditions along the middle coast of Chile at the time that a shallow depression just off the coast caused the unusual temperatures noted above.

TABLE 14.—*Temperatures at Punta Carranza to Isla Mocha on January 4, 1905*

Time	Punta Carranza	Punta Tumbes	Punta Lavapie	Isla Mocha
	°F.	°F.	°F.	°F.
7 a. m.	64	74	76	60
2 p. m.	64	95	89	63
9 p. m.	59	58	67	61
Maximum	68	101	96	65
Minimum	52	57	64	56

From the high maxima at Punta Angeles and Valdivia (Table 15), it may be assumed that the föhn occurs in the coastal region between latitudes 37° and 40° S.

Along the northern coast maximum temperatures are slightly above 90°; along the coast south of latitude 40° we find the extremes to be 79° at Punta Corona, 76° at Melinka, and only 60° at Evanjelistas. In contrast to this low maximum at Evanjelistas there are relative high maxima at the more eastern, leeward stations Punta Arenas (81°) and Punta Dungeness (80°).

Freezing temperatures occur along the coast from Valdivia southward and at nearly all of the inland stations except in the extreme north. The extreme minimum temperatures recorded for the entire country are −2° at Lonquimay (3,182 feet) and 9° at Potrerillos (2,789 feet). Unfortunately, temperature extremes are not available for Ollague (12,126 feet).

TABLE 15.—*Temperature data (°F.), Chile*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean maximum temperature														
Tacna	5	85.6	86.2	84.4	81.3	75.6	71.1	70.2	71.8	73.2	75.9	79.3	83.1	78.1
Arica	10	75.0	75.9	74.7	71.4	69.4	67.8	65.8	64.9	66.0	66.9	69.4	72.9	70.0
Iquique	13	76.8	77.0	74.7	71.6	68.9	66.2	64.9	65.5	67.1	69.8	72.9	75.0	70.9
Ollague, 2 p. m	3	66.6	64.4	66.2	64.2	60.1	54.1	54.9	57.0	59.4	63.5	53.5	65.8	61.6
Antofagasta	6	75.9	76.6	74.8	71.2	68.7	64.9	63.0	63.3	64.4	66.4	69.3	73.0	69.3
Refresco	4	81.9	80.6	82.2	81.1	77.0	73.6	77.0	75.7	79.9	80.4	81.0	80.6	79.2
Potrerillos	4	67.6	67.8	66.0	65.7	61.2	54.7	57.6	58.5	60.4	63.3	66.9	66.9	63.0
Caldera	14	71.8	72.1	69.6	66.0	63.1	60.8	59.9	60.4	61.9	64.4	67.5	70.2	65.6
Punta Tortuga	14	69.3	69.1	67.1	63.7	62.1	59.7	58.5	59.2	60.1	61.7	64.4	66.7	63.5
Ovalle	12	83.7	83.5	80.6	75.7	70.9	65.5	64.9	68.9	71.6	75.2	79.2	82.2	75.2
Los Andes	13	87.6	86.9	82.9	77.0	69.1	61.2	63.7	66.6	69.3	75.6	81.0	85.6	75.5
Punta Angeles	14	72.3	72.1	70.2	66.7	63.0	59.7	59.4	61.0	62.4	64.8	69.1	71.4	66.0
Santiago	14	85.5	84.7	80.4	73.6	65.1	58.1	59.0	62.2	65.3	71.6	78.3	83.3	72.3
El Teniente	13	66.7	66.2	64.2	60.6	54.0	46.2	48.0	49.3	51.6	56.8	59.7	64.4	57.3
Talca	12	87.1	85.6	79.7	70.7	65.1	55.6	55.9	59.5	64.4	71.2	77.7	83.3	71.3
Punta Carranza	14	66.0	65.3	63.7	61.0	59.2	56.7	56.1	56.1	57.2	59.7	61.9	64.4	60.6
Punta Tumbes	14	65.8	65.5	64.0	61.2	58.6	55.9	55.9	56.1	57.0	59.4	61.2	64.2	60.4
Punta Lavapie	12	68.7	67.6	65.5	62.4	59.2	56.3	55.4	55.6	57.0	60.1	63.0	66.2	61.4
Lonquimay	9	76.1	76.1	70.2	62.8	53.6	43.0	43.2	47.5	55.8	64.4	66.9	71.8	61.0
Temuco	9	76.8	76.8	72.0	64.9	57.7	52.5	54.1	54.9	59.4	65.1	68.9	72.5	64.6
Valdivia	11	73.0	71.8	68.7	61.7	56.1	51.4	51.8	53.8	56.7	62.4	64.4	68.7	61.7
Punta Corona	14	62.1	61.3	59.9	56.5	52.9	50.5	49.6	49.8	51.1	54.1	55.6	58.6	55.2
Melinka	11	63.3	63.0	60.6	56.5	52.3	50.2	50.0	50.0	51.6	55.8	56.8	60.4	55.9
Punta Dungeness	13	60.1	59.4	56.7	51.3	46.8	43.3	41.9	42.3	46.0	50.9	53.6	57.9	50.8
Evanjelistas	11	50.5	50.5	50.5	48.4	46.4	43.7	42.5	43.0	43.9	45.3	46.2	48.4	46.6
Punta Arenas	14	60.3	58.8	55.8	49.5	43.3	39.9	39.6	41.0	46.4	52.5	54.7	58.3	50.0
Mean minimum temperature														
Tacna	5	61.2	61.7	58.8	55.9	53.1	49.8	48.4	48.2	50.2	52.9	54.1	57.0	54.3
Arica	10	64.2	64.8	63.9	60.6	58.3	55.4	53.4	53.1	54.7	56.1	58.6	61.3	58.7
Iquique	14	62.1	61.5	59.7	57.4	55.6	54.9	54.0	54.1	55.0	56.5	58.3	60.1	57.4
Ollague, 7 a. m	3	46.3	43.5	40.6	31.6	25.3	20.5	14.9	23.2	31.3	41.2	45.1	49.1	34.4
Antofagasta	6	63.1	63.0	60.8	57.6	55.2	51.1	50.4	51.4	53.2	55.4	58.1	60.8	56.7
Refresco	4	46.0	44.2	44.6	43.9	42.3	39.4	42.8	42.1	44.6	45.7	47.5	48.4	44.3
Potrerillos	4	47.8	48.2	46.4	45.7	42.1	35.6	38.7	38.5	41.7	44.8	48.6	49.1	43.9
Caldera	13	60.4	60.8	58.8	55.6	53.2	50.0	49.5	50.0	51.3	53.4	56.1	58.8	54.8
Punta Tortuga	14	57.6	57.9	56.1	53.1	51.1	48.7	47.8	48.6	49.8	51.3	53.2	55.9	52.6
Ovalle	12	55.2	54.7	51.3	48.2	45.9	42.4	42.4	43.7	46.4	47.7	50.4	53.4	48.5
Los Andes	13	53.8	52.5	48.9	44.4	40.3	36.1	36.5	38.5	40.5	44.4	48.2	51.8	44.6
Punta Angeles	14	56.5	55.8	54.3	51.8	50.0	46.8	46.8	46.8	48.0	50.2	52.3	54.7	51.2
Santiago	14	53.1	51.6	48.9	44.8	41.4	37.0	37.2	38.8	41.7	45.1	48.4	51.3	44.9
El Teniente	12	51.1	50.5	47.3	44.1	39.2	32.0	33.1	33.1	34.7	39.7	43.5	48.2	41.4
Talca	12	54.0	51.8	49.3	44.4	41.5	37.9	38.3	38.7	40.6	45.9	48.7	51.1	45.1
Punta Carranza	14	52.5	52.2	51.3	49.1	47.5	44.6	44.4	43.9	44.8	47.1	48.9	50.9	48.1
Punta Tumbes	14	52.7	52.5	51.6	49.8	47.8	44.2	44.2	43.5	44.4	46.8	48.7	51.1	48.1
Punta Lavapie	13	54.0	53.6	53.1	50.9	49.1	46.2	46.2	45.5	45.9	47.5	49.1	51.4	49.4
Lonquimay	9	40.3	38.1	36.9	33.1	31.8	26.8	26.1	27.3	29.7	33.6	36.1	38.7	33.2
Temuco	8	50.2	48.9	48.2	44.4	42.4	38.3	39.0	38.8	40.5	43.7	45.9	48.6	44.1
Valdivia	11	51.6	50.4	48.9	45.9	43.9	40.6	41.0	39.9	40.5	43.5	45.7	49.5	45.1
Punta Corona	14	51.1	50.4	49.5	46.6	44.4	42.6	42.4	41.7	42.4	44.8	46.4	49.3	46.0
Melinka	11	49.3	49.1	47.7	45.3	42.8	40.8	41.0	40.3	40.6	43.0	44.6	47.3	44.3
Punta Dungeness	13	45.9	45.5	44.8	40.1	36.3	33.6	32.9	33.4	35.2	38.3	40.5	43.7	39.2
Evanjelistas	13	43.5	43.7	43.3	41.0	38.5	36.9	36.1	36.1	37.0	39.0	39.7	42.1	39.7
Punta Arenas	14	45.0	43.9	42.1	37.8	34.5	31.8	31.1	31.8	35.1	38.1	39.7	43.3	37.8
Mean temperature (maximum+minimum+2)														
Tacna	5	73.4	74.0	71.6	68.6	64.4	60.4	59.3	60.0	61.7	64.4	66.7	70.0	66.2
Arica	10	69.6	70.4	69.3	66.0	63.8	61.6	59.6	59.0	60.4	61.5	64.0	67.1	64.4
Iquique	13	69.4	69.2	67.2	64.5	62.2	60.6	59.4	59.8	61.0	63.2	65.6	67.6	64.1
Ollague, 2 p. m., 7 a. m	3	56.4	54.0	53.4	47.9	42.7	37.3	34.9	40.1	45.4	52.4	54.3	57.4	48.0
Antofagasta	6	69.5	69.8	67.8	64.4	62.0	58.0	56.7	57.4	58.8	60.9	63.7	66.9	63.0
Refresco	4	64.0	62.4	63.4	62.5	59.6	56.5	59.9	58.9	62.2	63.0	64.2	64.5	61.8
Potrerillos	4	57.7	58.0	56.2	55.7	51.6	45.2	48.2	48.5	51.0	54.0	57.8	58.0	53.5
Caldera	13	66.1	66.4	64.2	60.8	58.2	55.4	54.7	55.2	56.6	58.9	61.8	64.5	60.2
Punta Tortuga [1]	14	63.4	63.5	61.6	58.4	56.6	54.2	53.2	53.9	55.0	56.5	58.8	61.3	58.0
Ovalle	12	69.4	69.1	66.0	62.0	58.4	54.0	53.6	56.3	59.0	61.4	64.8	67.8	61.8
Los Andes	13	70.7	69.7	65.9	60.7	54.7	48.6	50.1	52.6	54.9	60.0	64.6	68.5	60.1
Punta Angeles	14	64.4	64.0	62.2	59.2	56.5	53.2	53.1	53.9	55.2	57.5	60.7	63.0	58.6
Santiago [1]	14	69.3	68.2	64.6	59.2	53.2	47.6	48.1	50.5	53.5	58.3	63.4	67.3	58.6
El Teniente	12	58.9	58.4	55.8	52.4	46.6	39.1	40.6	41.2	43.2	48.2	51.6	56.3	49.3
Talca	12	70.6	68.7	64.5	57.6	53.3	46.8	47.1	49.1	52.5	58.1	63.2	67.2	58.2
Punta Carranza	14	59.2	58.8	57.5	55.0	53.4	50.6	50.2	50.0	51.0	53.4	55.4	57.6	54.3
Punta Tumbes	14	59.2	59.0	57.8	55.5	53.2	50.0	50.0	49.8	50.7	53.1	55.0	57.6	54.2
Punta Lavapie	12	61.4	60.6	59.3	56.6	54.2	51.2	50.8	50.6	51.4	53.8	56.0	58.8	55.4
Lonquimay	9	58.2	57.1	53.6	48.0	42.7	34.9	34.6	37.6	42.8	49.0	51.3	55.2	47.1
Temuco	8	63.5	62.8	60.1	54.6	50.0	45.4	46.6	46.8	50.0	54.4	57.4	60.6	54.4
Valdivia	11	62.3	61.1	58.8	53.8	50.0	46.0	46.2	46.8	48.6	53.0	55.0	59.1	53.4
Punta Corona	14	56.6	55.8	54.7	51.6	48.6	46.6	46.0	45.8	46.8	49.4	51.0	54.0	50.6
Melinka	11	56.3	56.0	54.2	50.9	47.6	45.5	45.5	45.2	46.1	49.4	50.7	53.8	50.1
Punta Dungeness	13	53.0	52.8	50.8	45.7	41.6	38.4	37.4	37.8	40.6	44.6	47.0	50.8	45.0
Evanjelistas [1]	11	47.0	47.1	46.9	44.7	42.4	40.3	39.3	39.6	40.4	42.2	43.0	45.2	43.2
Punta Arenas [1]	14	52.6	51.4	49.0	43.6	38.9	35.8	35.4	36.2	40.8	45.3	47.2	50.8	43.9
Mean temperature (7 a. m.+2 p. m.+9 p. m.+9 p. m.+4)														
Tacna	5	70.3	71.4	69.4	62.6	61.2	57.2	55.4	56.3	57.9	60.8	63.3	67.3	62.8
Arica	10	72.3	73.0	71.6	68.4	65.7	63.1	61.3	61.2	62.4	64.0	66.9	70.0	66.7
Refresco	11	63.1	62.2	60.4	57.9	54.9	50.5	52.0	52.7	54.9	57.2	60.3	62.2	57.4
Caldera	14	66.4	66.9	64.6	61.2	58.6	55.9	55.2	55.9	57.0	59.2	62.1	64.8	60.6
Ovalle	12	67.8	67.8	62.6	58.6	56.1	51.8	51.4	53.2	56.1	58.3	62.6	65.8	59.3
Punta Angeles	14	63.7	63.0	61.2	58.1	55.6	52.3	52.3	53.1	54.1	56.7	56.5	62.4	57.4
Santiago	14	68.7	67.1	62.4	56.7	51.1	45.7	46.2	48.6	51.8	56.8	62.2	66.6	57.0
Punta Lavapie	13	61.9	61.0	59.7	56.8	54.3	51.6	51.3	50.7	51.8	54.0	56.5	59.5	55.8
Lonquimay	9	60.1	58.1	53.8	47.8	42.8	34.9	34.2	36.9	42.3	48.7	52.0	56.1	47.3
Temuco	9	61.7	60.6	57.7	53.6	49.5	45.1	46.2	46.4	48.7	52.7	55.6	59.0	53.1
Valdivia	12	61.9	60.4	57.9	53.1	49.6	45.7	46.0	46.2	48.0	52.3	55.0	59.0	52.9
Melinka	11	55.9	55.8	53.6	50.7	47.8	45.9	45.7	45.1	46.0	49.1	50.5	53.6	50.0
Evanjelistas	14	47.5	47.5	47.1	44.4	42.1	40.3	39.6	39.4	40.6	42.3	43.2	45.5	43.3
Punta Arenas	14	52.5	51.3	48.7	43.7	39.2	36.7	35.8	36.7	40.6	45.3	47.3	50.9	44.1

[1] Monthly record of temperature and pressure in Smithsonian Miscellaneous Collections, vol. 79.

TABLE 15.—*Temperature data (°F.), Chile*—Continued

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Coast		**Mean daily range in temperature [2]**												
Arica	10	10.8	11.1	10.8	10.8	11.1	12.4	12.4	11.8	11.3	10.8	10.8	11.6	11.3
Caldera	13	11.4	11.3	10.8	10.4	9.9	10.8	10.4	10.4	10.6	11.0	11.4	11.4	10.8
Punta Angeles	14	15.8	16.3	15.9	14.9	13.0	12.9	12.6	14.2	14.4	14.6	16.8	16.7	14.8
Punta Lavapie	12	14.7	14.0	12.4	11.5	10.1	10.1	9.2	10.1	11.1	12.6	13.9	14.8	12.0
Valdivia	11	21.4	21.4	19.8	15.8	12.2	10.8	10.8	13.9	16.2	18.9	18.7	19.2	16.6
Melinka	11	14.0	13.9	12.9	11.2	9.5	9.4	9.0	9.7	11.0	12.8	12.2	13.1	11.6
Evanjelistas	11	7.0	6.8	7.2	7.4	7.9	6.8	6.4	6.9	6.9	6.3	6.5	6.3	6.9
Punta Arenas	14	15.3	14.9	13.7	11.7	8.8	8.1	8.5	9.2	11.3	14.4	15.0	15.0	12.2
Interior														
Tacna	5	24.4	24.5	25.6	25.4	22.5	21.3	21.8	23.6	23.0	23.0	25.2	26.1	23.8
Refresco	4	35.9	36.4	37.6	37.2	34.7	34.2	34.2	33.6	35.3	34.7	33.5	32.2	34.7
Ovalle	12	28.5	28.8	29.3	27.5	25.0	23.1	22.5	25.2	25.2	27.5	28.8	28.8	26.7
Santiago	14	32.4	33.1	31.5	28.8	23.7	21.1	21.8	23.4	23.6	26.5	29.9	32.0	27.4
Lonquimay	9	35.8	38.0	33.3	29.7	21.8	16.2	17.1	20.2	26.1	30.8	30.8	33.1	27.8
		Highest temperature												
Tacna	5	92	97	91	95	86	86	80	84	86	81	91	90	97
Arica	17	90	88	90	86	83	83	86	80	81	86	81	85	90
Iquique	25	90	92	86	82	79	86	82	74	80	85	89	91	92
Antofagasta	16	86	90	92	86	82	79	77	78	79	82	82	85	92
Refresco	11	90	90	90	90	88	84	86	88	89	89	87	88	90
Potrerillos	4	78	77	73	77	78	72	71	72	74	72	78	78	78
Caldera	25	86	85	82	77	75	70	70	75	75	76	76	80	86
Punta Tortuga	25	79	79	77	75	73	72	70	70	73	73	75	80	80
Ovalle	12	92	93	94	91	85	83	86	86	87	96	97	94	97
Los Andes	13	96	99	92	91	89	81	86	89	91	95	96	99	99
Punta Angeles	25	86	94	89	87	81	76	80	78	79	88	91	91	94
Santiago	21	96	98	94	88	87	80	81	85	88	92	97	99	99
El Teniente	11	82	82	78	77	78	68	69	67	71	76	77	77	82
Talca	11	100	98	96	85	82	66	69	75	82	85	95	98	100
Punta Carranza	24	77	79	74	70	68	68	65	70	68	71	70	75	79
Punta Tumbes	24	101	83	84	82	76	71	74	73	75	81	82	84	101
Punta Lavapie	19	96	88	89	81	71	73	72	73	77	75	88	82	96
Lonquimay	9	99	93	93	84	74	60	57	68	82	88	92	97	99
Temuco	9	98	96	95	82	76	68	69	68	74	84	90	95	98
Valdivia	11	91	95	90	81	71	62	63	68	75	84	90	88	95
Punta Corona	14	74	75	75	67	60	58	56	59	60	68	74	79	79
Melinka	17	76	74	76	68	59	59	56	56	64	67	72	76	76
Punta Dungeness	17	77	80	74	63	58	53	52	54	58	68	70	76	80
Evanjelistas	22	58	60	60	56	53	54	53	50	51	52	57	56	60
Punta Arenas	19	81	77	73	64	60	54	51	51	61	65	72	77	81
		Lowest temperature												
Tacna	5	52	52	46	48	46	44	41	41	45	43	50	50	41
Arica	17	54	58	57	52	50	48	46	47	49	49	51	52	46
Iquique	25	52	53	52	47	46	46	45	43	47	49	50	50	43
Antofagasta	16	55	54	55	51	49	46	45	46	49	50	51	52	45
Refresco	4	39	39	39	39	34	27	27	32	33	36	40	40	27
Potrerillos	4	38	36	34	34	29	15	9	10	24	23	36	40	9
Caldera	24	53	48	47	44	41	39	39	39	39	43	43	45	39
Punta Tortuga	25	46	48	46	41	39	39	37	37	37	41	41	42	37
Ovalle	12	44	45	42	39	34	34	33	35	37	38	41	47	33
Los Andes	13	46	46	37	34	28	23	23	24	29	34	37	41	23
Punta Angeles	25	50	50	46	44	39	36	36	39	39	44	45	48	36
Santiago	21	43	43	38	33	27	26	24	26	31	32	37	36	24
El Teniente	12	35	37	23	27	20	13	10	13	11	22	27	30	10
Talca	11	44	43	36	32	23	25	24	24	29	34	37	37	23
Punta Carranza	24	46	45	43	39	37	33	34	34	36	38	41	43	33
Punta Tumbes	24	44	41	43	36	36	33	34	34	33	35	37	40	33
Punta Lavapie	19	45	43	43	41	37	36	37	37	38	37	40	41	36
Lonquimay	9	27	25	20	17	16	1	0	−2	16	22	21	26	−2
Temuco	9	39	37	36	29	27	21	26	26	25	31	33	36	21
Valdivia	11	36	35	36	29	29	25	27	28	28	31	32	37	25
Punta Corona	15	40	37	38	39	36	33	35	33	35	37	39	42	33
Melinka	11	41	42	39	33	33	29	30	32	32	32	35	40	29
Punta Dungeness	22	35	34	32	29	21	21	19	20	22	28	33	30	19
Evanjelistas	24	36	32	34	31	28	27	24	26	26	30	29	32	24
Punta Arenas	19	36	35	31	21	19	19	15	20	23	28	28	32	15
		Mean number of days with minimum temperature below 32°												
Refresco	7	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.1	0.3	0.0	0.0	0.0	3.3
Potrerillos	4	0.0	0.0	0.0	0.0	1.5	10.5	3.5	2.5	1.0	0.7	0.0	0.0	20.7
Los Andes	13	0.0	0.0	0.0	0.0	1.2	5.4	5.9	2.1	0.7	0.0	0.0	0.0	15.3
Santiago [3]	14	0.0	0.0	0.0	0.0	1.1	5.0	5.2	2.4	0.1	0.0	0.0	0.0	13.8
El Teniente	12	0.0	0.0	0.5	1.0	4.1	14.0	12.8	13.2	10.8	4.2	1.1	0.2	61.9
Talca [3]	11	0.0	0.0	0.0	0.0	2.5	5.8	5.5	3.0	0.3	0.0	0.0	0.0	17.1
Lonquimay	9	2.2	4.3	6.6	14.7	15.1	19.2	21.8	21.8	18.6	11.9	7.2	4.6	48.0
Temuco	9	0.0	0.0	0.0	0.6	1.7	5.1	5.0	4.0	1.4	0.1	0.0	0.0	17.9
Valdivia [3]	10	0.0	0.0	0.0	0.3	0.6	2.6	2.4	2.9	1.5	0.3	0.0	0.0	10.6
Melinka [3]	11	0.0	0.0	0.0	0.0	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.7
Punta Dungeness [3]	13	0.0	0.0	0.0	0.0	2.1	5.8	8.8	8.2	2.2	0.2	0.0	0.0	27.3
Evanjelistas [3]	14	0.0	0.0	0.0	0.0	1.4	2.3	3.5	3.5	1.1	0.1	0.5	0.0	12.4
Punta Arenas [3]	12	0.0	0.0	0.3	2.8	8.9	14.9	15.5	14.3	5.8	1.7	1.2	0.0	65.4
		Mean number of days with maximum temperature below 32° F.												
Potrerillos	4	0.0	0.0	0.0	0.0	0.2	0.5	1.5	0.0	0.0	0.2	0.0	0.0	2.4
El Teniente	10	0.0	0.0	0.0	0.0	0.0	1.0	1.2	0.5	0.2	0.0	0.0	0.0	2.9
Lonquimay	8	0.0	0.0	0.0	0.0	0.0	0.1	1.4	0.1	0.0	0.0	0.0	0.0	2.6
Punta Arenas	10	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.1	0.0	0.0	0.0	0.0	0.7

[2] Difference between mean daily maximum and mean daily minimum.

[3] See table of minimum temperatures for months in which temperatures at some stations fell to 32.5° F. or slightly lower.

The frequency of frost days, minimum temperature 32° or lower, is given in Table 15; the highest values of the mean annual number are 148 at Lonquimay, 65 at Punta Arenas, and 62 at El Teniente. Ice days, maximum temperature 32° or lower, are rare at these stations with severest winters, the average annual number being about 3.

Relative humidity.—The highest values of the annual mean, based on tridaily observations, are found, as is to be expected, along the coast; from Iquique to Evanjelistas the means are 78 per cent or higher with maximum about 85 per cent at Punta Tumbes and Punta Corona. The lowest annual means are 53 per cent at Refresco and 59 per cent at Los Andes. Along the coast there is little seasonal change in relative humidity, but at some interior stations there is marked difference between values for rainy and dry seasons (Santiago, 80 per cent in June and 55 per cent in December).

TABLE 16.—*Relative humidity data, Chile* [1]

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean relative humidity (7 a. m.+2 p. m.+9 p. m.+3)														
Tacna	5	64	63	66	70	76	77	78	77	77	73	72	71	72
Arica	8	73	73	75	73	73	74	74	75	76	74	74	73	74
Iquique	8	82	80	81	80	81	82	78	80	80	80	80	79	80
Antofagasta	8	71	70	72	69	72	71	72	69	70	69	67	68	70
Refresco	5	58	59	59	56	53	52	48	52	49	48	48	51	53
Punta Tortuga	14	80	80	81	83	84	83	83	83	81	81	80	80	82
Ovalle	5	60	62	66	69	77	80	80	77	75	70	64	59	70
Los Andes	14	52	52	56	62	66	62	65	66	64	60	54	52	59
Punta Angeles	14	70	70	73	75	77	76	76	75	74	73	67	66	73
Santiago	14	56	59	65	71	78	80	79	78	74	69	59	55	69
Santiago [2]	30	61	64	70	75	80	85	83	83	78	74	68	62	74
Talca	11	53	55	64	73	83	85	84	80	74	69	61	55	70
Punta Tumbes	14	82	83	83	86	87	86	87	85	83	84	83	82	84
Lonquimay	8	67	70	76	78	83	88	88	84	77	72	70	69	77
Temuco	4	70	73	77	80	85	85	85	84	80	78	73	70	78
Valdivia	12	71	72	77	84	89	89	88	86	81	76	75	73	80
Valdivia [2]	5	74	74	81	86	89	93	91	89	83	80	75	76	83
Punta Corona	13	83	85	86	87	87	87	88	87	84	84	83	84	85
Evanjelistas	9	79	80	78	78	79	78	78	77	78	78	79	79	78
Punta Arenas	13	63	65	68	73	79	78	79	76	71	64	62	62	70
Mean relative humidity 7 a. m.														
Tacna	5	70	72	71	77	85	85	86	87	84	82	80	77	80
Arica	8	74	74	74	73	72	73	74	76	77	75	75	74	74
Iquique	8	83	83	83	83	83	82	80	82	82	82	81	80	82
Antofagasta	8	70	75	77	77	77	76	77	74	73	72	69	71	74
Refresco	5	56	60	59	56	53	54	51	53	49	46	46	48	53
Punta Tortuga	14	85	86	86	87	88	86	87	88	86	86	85	85	86
Ovalle	5	67	71	78	81	85	86	86	83	83	78	68	62	77
Los Andes	14	67	68	74	78	80	82	76	79	78	73	67	66	74
Punta Angeles	14	82	85	86	86	86	83	83	84	85	84	78	78	83
Santiago	14	71	78	88	91	93	93	92	92	89	83	72	69	84
Talca	11	69	72	81	88	93	93	92	91	88	82	76	69	83
Punta Tumbes	14	84	85	87	87	89	87	88	87	86	86	84	84	86
Lonquimay	8	82	87	92	93	93	93	93	94	92	88	82	82	89
Temuco	4	87	91	93	93	94	92	94	94	93	89	84	82	90
Valdivia	12	79	84	90	94	94	94	93	94	91	86	82	81	88
Punta Corona	13	87	90	90	89	90	90	90	90	87	87	86	87	89
Evanjelistas	9	81	81	79	80	79	79	79	79	79	79	80	80	80
Punta Arenas	13	66	69	74	79	82	80	82	81	76	69	65	65	74
Mean relative humidity 2 p. m.														
Tacna	5	47	48	54	56	60	62	61	60	61	55	56	56	56
Arica	8	71	71	72	72	73	74	75	75	75	74	74	72	73
Iquique	8	79	76	77	78	78	77	76	77	77	76	78	78	77
Antofagasta	8	62	61	60	59	63	62	61	60	64	62	60	60	61
Refresco	5	53	52	49	51	47	46	41	45	45	43	43	45	47
Punta Tortuga	14	71	72	73	76	77	77	77	77	74	72	71	71	74
Ovalle	5	40	41	42	49	63	69	70	64	58	53	47	42	53
Los Andes	14	31	31	34	38	45	52	47	46	42	38	33	31	39
Punta Angeles	14	57	57	59	62	68	68	69	66	63	61	55	55	62
Santiago	14	37	37	40	44	55	61	57	54	52	48	39	36	47
Talca	11	35	36	43	53	68	74	73	65	57	50	43	37	53
Punta Tumbes	14	75	77	80	82	85	84	84	81	80	80	80	78	80
Lonquimay	8	46	49	57	61	73	82	82	72	60	51	53	50	61
Temuco	4	48	52	58	64	74	76	74	73	64	62	55	52	63
Valdivia	12	53	55	60	71	80	82	82	74	67	60	61	59	67
Punta Corona	13	79	80	82	85	86	86	86	84	81	80	80	80	82
Evanjelistas	9	78	79	77	76	78	76	75	76	77	77	77	77	77
Punta Arenas	13	55	56	59	66	74	75	76	69	62	55	54	54	63

[1] See paragraph on relative humidity in text.
[2] Santiago, means from hourly readings; Valdivia, means from bihourly readings. Climate of Chile. R. C. Mossman. Journal of the Scottish Meteorological Society, Vol. XV (1910), p. 345.

Table 16 giving mean relative humidity at 2 p. m. sets forth more clearly the contrast between the humidity of the coastal air and that of the interior; for example, at Iquique, Punta Tumbes, Punta Corona, and Evanjelistas all monthly means are above 75 per cent, while in the interior such values are found only in the south in the rainy midyear. In the northern interior the air is very dry during midday hours; the extreme condition appears at Los Andes, where the mean at 2 p. m. is 39 per cent for the year and only 52 per cent for June, a month with moderate precipitation.

Cloudiness.—Mean annual cloudiness has a remarkably wide range. At Refresco, near the Atacama Desert, it is 0.8, while at Evanjelistas, in the region swept almost constantly by the westerly winds, it is 8.7. Over most regions, however, the annual mean is about 5.0, corresponding to conditions found over the greater part of the earth. In the extreme, rainy south, where skies are uniformly cloudy, and in the arid north, where the coast has moderate cloudiness and the interior unusually clear skies, seasonal change is slight; elsewhere cloudiness is much greater in the colder, rainy, midyear season than in the warmer, dry months from December to February, inclusive.

TABLE 17.—*Mean cloudiness Chile* [1]

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Tacna	6	6.2	5.7	5.1	5.4	5.6	6.0	6.4	6.3	6.3	6.0	6.0	6.0	5.9
Arica	10	5.1	4.1	3.3	3.9	6.0	6.9	7.0	7.2	6.8	6.2	5.4	4.2	5.5
Iquique	14	4.8	3.6	3.5	4.0	5.7	7.9	8.5	8.4	8.2	7.0	5.7	4.3	6.0
Ollague	3	3.8	4.4	2.5	1.8	0.9	2.2	2.3	2.0	2.1	2.4	2.3	2.8	2.5
Antofagasta	9	3.2	2.4	2.8	3.3	3.7	3.8	3.9	4.1	4.4	4.3	3.5	3.5	3.6
Refresco	11	0.9	0.4	0.5	0.8	1.2	1.6	1.5	0.8	0.9	0.7	0.3	0.6	0.8
Potrerillos	4	1.4	1.9	0.8	0.6	2.2	2.6	2.0	1.8	1.3	1.4	0.4	0.7	1.4
Punta Tortuga	14	4.6	4.0	4.5	5.7	5.7	5.5	5.7	5.4	5.6	5.7	4.8	4.6	5.2
Ovalle	11	1.7	1.3	1.5	2.3	3.1	3.6	3.3	2.9	2.8	3.0	1.8	1.6	2.4
Los Andes	14	1.4	1.4	1.9	3.2	4.7	5.4	4.9	4.9	4.7	4.4	3.3	1.8	3.5
Punta Angeles	14	3.5	3.1	3.5	4.6	5.2	5.0	5.2	4.8	4.7	5.1	3.8	3.3	4.3
Santiago	14	1.8	1.7	2.4	3.6	5.4	5.8	5.6	5.2	5.3	4.7	3.7	2.3	4.0
Talca	12	1.6	1.4	2.5	4.4	6.3	6.3	6.1	5.5	5.1	4.8	3.6	2.5	4.2
Punta Tumbes	14	3.0	3.7	4.4	5.3	6.2	5.9	6.0	5.4	4.9	4.8	4.1	3.4	4.8
Lonquimay	9	3.3	3.5	5.1	5.5	6.8	7.3	7.0	6.7	5.6	5.2	4.9	3.9	5.4
Valdivia	11	4.3	4.7	5.6	7.2	8.5	8.2	8.2	7.8	6.7	6.3	5.9	5.5	6.6
Punta Corona	14	5.1	5.7	6.2	7.1	8.0	7.6	7.8	7.4	6.6	6.1	6.8	6.7	6.8
Melinka	11	5.1	5.2	5.5	6.3	6.9	6.6	7.0	6.5	6.3	5.5	6.2	6.3	6.1
Punta Dungeness	13	6.1	6.0	5.9	5.9	6.0	5.8	5.8	5.4	5.6	5.3	6.3	6.6	5.9
Evanjelistas	14	8.9	9.0	8.9	8.9	8.7	8.5	8.5	8.5	8.5	8.6	9.0	8.9	8.7
Punta Arenas	13	7.3	7.2	7.0	6.8	6.8	6.5	6.6	6.4	6.4	6.6	7.4	7.7	6.9

[1] Means from observations at 7 a. m., 2 p. m., and 9 p. m.

TABLE 18.—*Sunshine data, Chile*

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean daily duration in hours													
Santiago [1]	10.7	11.0	9.3	7.7	5.1	4.1	4.5	5.2	5.5	7.3	9.0	10.8	7.5
Punta Arenas [2]	7.4	5.5	5.9	4.3	3.5	2.6	3.1	4.0	4.7	7.0	7.2	7.2	5.2
Mean percentage of possible													
Santiago [1]	76	83	76	68	48	41	44	48	47	57	65	76	61

[1] Period 1919–1923. Mean annual duration, 2,738 hours.
[2] Period April, 1916–December, 1918. Mean annual duration, approximately 1,900 hours.

Fog is rare in the northern areas, but from Punta Tortuga southward (except at Punta Arenas and Punta Dungeness) meteorological conditions are very much changed in this respect, and over both coastal and interior regions fog is rather frequent, occurring on from 40 to 95 days annually, according to the extent to which local conditions are favorable to its formation.

Precipitation.—In this area of meteorological contrasts due to range in latitude and elevation above sea level no element shows greater variation than that found for precipitation. The extreme mean annual amounts of rainfall are 0.02 inch at Arica and 200.33 inches at Bahia Felix.

From the northern boundary to latitude 27° 30′ S. the mean annual rainfall is less than 0.75 inch along the coast and reaches a maximum of only 2.34 inches at the elevated station Ollague (12,123 feet); south of this extremely arid region there is a well-defined increase in precipitation, and at latitude 33° we find values of 20 inches on the coast (Valparaiso) and 14 inches in the interior (Santiago).

At latitude 36° the mean yearly rainfall has increased to 30 inches both on the coast and in the interior (Punta Carranza and Talca), and from this region to the extreme southern limit of the country precipitation is moderate, abundant, or excessive, except at Punta Dungeness (8.73 inches) and Punta Arenas (18.86 inches), stations in the southern part of the great "rain shadow" which includes a large part of southern Argentina.

Between the latitudes of Punta Tumbes and Melinka there is great variability in annual amounts of precipitation; the most marked contrasts are those between Punta Tumbes (20 inches) and Concepcion (51 inches) in the north and Isla Guafo (41 inches) and Melinka (125 inches) in the south.

At nearly all stations the annual march of precipitation shows a winter maximum (in June in the northern half of the country, in May or June in the southern half), and a summer minimum (generally in January or February, but in October from Cabo Raper southward.) Outside the arid region the contrast in means for the wettest and driest months is well marked in all regions north of Cabo Raper. Some of the greatest differences (in inches) are: Los Guindos, 26.76 and 2.96; Casapangue, 21.92 and 4.30; Panguipulli, 17.58 and 2.78; and Valdivia, 16.94 and 2.46. At the station having maximum rainfall for Chile, Bahia Felix, the extreme monthly means are 18.89 inches in April and 13.26 inches in October.

Precipitation in 24 hours exceeding 7 inches has been recorded at several stations; the highest record is 8.85 inches at Los Guindos.

The mean annual number of days with precipitation is practically zero in the extreme north, about 50 in the vicinity of Santiago, 100 at Concepcion, 175 at Valdivia, 200 at Puerto Montt, 285 at Cabo Raper, 318 at Evanjelistas, and 325 at Bahia Felix. On the basis of frequency, the last-named stations must be counted among the rainiest points on the earth.

Snow rarely falls except at elevated stations (El Teniente, 6,800 feet; Lonquimay, 3,180 feet) and in the extreme south (Evanjelistas and Punta Arenas); in these regions the average number of days with snow during the year is 36 and 28, respectively. Valdivia probably marks the northern limit of snowfall along the coast.

TABLE 19.—*Precipitation data, Chile*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
		Mean precipitation (inches)												
Tacna	7	0.24	0.01	T.	0.08	0.07	T.	0.13	0.19	0.27	0.12	0.05	0.09	1.25
Arica	17	0.02	T.	0.00	0.00	0.00	T.	T.	T.	0.00	T.	T.	0.00	0.02
Iquique [1]	25	T.	T.	T.	T.	T.	T.	0.03	0.01	0.01	T.	T.	0.00	0.05
Ollague [2]	5	0.80	0.98	0.06	0.00	0.00	0.00	0.00	0.02	0.04	T.	0.24	0.20	2.34
Antofagasta	16	0.00	0.00	T.	T.	0.01	0.02	0.04	0.01	0.02	0.02	0.03	0.01	0.16
Refresco	10	0.00	0.00	0.02	0.00	0.09	0.12	0.02	T.	T.	0.06	0.00	0.00	0.31
Potrerillos	4	0.32	0.25	0.08	T.	0.02	0.24	T.	0.33	T.	T.	0.00	T.	1.24
Caldera	25	0.01	T.	T.	T.	0.14	0.13	0.15	0.08	0.03	0.02	0.02	0.01	0.59
Copiapo	14	0.00	0.00	0.00	T.	0.13	0.21	0.23	0.07	T.	0.01	T.	0.00	0.65
La Pampa	8	0.01	0.03	0.08	0.00	1.60	0.74	1.20	0.61	0.24	0.02	0.00	0.04	4.57
Punta Tortuga [2]	25	T.	T.	0.06	0.03	1.15	1.54	1.16	0.55	0.15	0.02	0.04	0.01	4.71
Ovalle	12	T.	T.	T.	0.01	1.40	1.31	1.02	0.59	0.47	0.02	0.08	T.	4.90
Combarbala	6	0.00	0.00	0.02	0.03	1.62	2.37	2.28	1.41	0.25	0.00	0.00	0.00	7.98
Los Andes	19	0.04	0.00	0.21	0.71	2.98	3.79	1.82	1.47	1.09	0.28	0.11	0.17	12.67
Punta Angeles	32	0.01	0.01	0.37	0.50	4.29	5.70	4.00	2.70	1.22	0.44	0.33	0.11	19.68
Santiago [3]	58	0.03	0.06	0.19	0.57	2.44	3.29	3.11	2.17	1.23	0.54	0.26	0.20	14.09
El Teniente	13	0.39	0.26	0.70	2.48	8.17	9.49	6.68	5.30	3.18	1.94	1.88	0.20	40.67
San Fernando	15	0.07	0.02	0.40	1.72	6.10	7.15	4.61	3.47	1.85	0.85	1.07	0.28	27.59
Talca	15	0.16	0.15	0.57	1.64	6.72	6.50	5.02	3.20	2.05	0.82	0.96	0.25	28.04
Punta Carranza	23	0.17	0.18	0.78	1.74	5.17	6.99	5.65	3.26	2.33	0.67	0.71	0.38	28.03
Chillan	11	0.39	0.51	1.58	2.32	7.85	8.24	6.54	5.30	3.46	1.41	1.80	0.77	40.17
Punta Tumbes	24	0.14	0.34	0.74	1.54	3.52	4.19	3.40	2.85	1.76	0.76	0.58	0.40	20.22
Concepcion	45	0.69	0.84	2.40	3.32	7.78	9.81	9.80	7.28	4.00	2.27	1.81	1.03	51.03
Punta Lavapie	20	0.47	0.56	1.41	2.63	4.98	5.72	5.04	3.63	2.56	1.24	1.30	0.88	30.42
Contulmo	15	1.44	1.32	3.34	6.04	13.03	11.37	12.10	9.32	5.68	2.52	3.82	2.11	72.09
Los Guindos	7	3.30	2.96	8.76	9.80	26.76	20.11	21.74	17.54	8.60	6.45	9.89	3.20	139.11
Lonquimay	11	1.54	1.78	4.28	5.30	13.27	10.29	11.72	10.07	6.23	2.46	4.54	2.38	73.86
Temuco	12	1.09	1.14	2.94	4.93	9.68	6.50	7.50	5.98	3.35	2.38	3.28	2.38	51.15
Panguipulli	11	3.04	2.78	6.48	8.72	17.58	14.32	14.71	12.21	8.87	4.51	6.66	4.26	104.14
Valdivia [3]	52	2.46	2.80	5.63	9.17	15.53	16.94	16.63	13.38	8.22	5.28	4.88	4.21	105.13
Casapangue	7	4.30	5.73	12.82	16.31	21.92	15.33	15.94	16.30	8.90	4.95	8.11	8.91	139.52
Puerto Montt	40	4.73	4.10	6.27	7.56	11.21	9.53	10.70	9.43	6.22	5.28	5.48	5.56	86.07
Punta Corona	24	2.69	3.72	5.24	7.92	10.72	11.06	9.94	10.17	6.35	3.85	5.06	4.25	80.97
Isla Guafo	17	2.45	2.63	3.22	4.03	5.03	4.63	4.12	5.03	2.74	2.19	2.46	2.56	41.09
Melinka	11	5.99	6.62	8.54	10.63	13.76	14.48	15.06	12.80	10.11	7.54	9.72	9.68	124.93
Cabo Raper	12	6.18	6.34	6.66	8.06	7.39	6.43	6.73	7.73	6.74	5.42	6.51	6.41	80.60
Punta Dungeness	21	1.05	0.69	0.84	1.00	0.78	0.67	0.80	0.59	0.43	0.38	0.45	1.05	8.73
Evanjelistas [3]	26	11.78	9.59	11.43	11.16	9.61	9.31	9.56	8.59	9.35	8.88	9.91	10.16	119.33
Bahia Felix	12	17.64	17.98	18.77	18.89	17.04	14.46	16.34	13.63	16.46	13.26	18.14	17.72	200.33
Punta Arenas [3]	20	1.26	1.02	1.59	2.03	2.59	1.78	2.13	1.51	1.50	0.85	1.28	1.32	18.86
Bahia Harris	10	2.48	3.00	3.43	3.41	3.68	2.70	2.94	2.61	2.32	1.29	2.26	2.83	32.95

[1] Rain on 1 day in June, 1911, amount not measured.
[2] Days with rain in June and July (1915), amounts not given.
[3] Monthly records in Smithsonian Miscellaneous Collections, vol. 79.

TABLE 19.—*Precipitation data, Chile*—Continued

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Maximum precipitation in 24 hours (inches)														
Tacna	6	0.79	0.64	0.01	0.39	0.04	T.	0.27	0.37	0.16	0.20	0.12	0.21	0.79
Arica	17	0.39	T.	0.00	0.00	0.00	T.	T.	T.	0.00	T.	T.	0.00	0.39
Iquique	25	T.	T.	T.	0.01	0.06	T.	0.59	0.10	0.20	0.11	T.	0.00	0.59
Ollague	3	0.47	1.57	0.20	0.00	0.00	0.00	0.00	0.12	0.20	T.	0.50	0.35	1.57
Antofagasta	16	0.00	0.00	0.00	0.00	0.11	0.18	0.22	0.10	0.27	0.24	0.14	0.10	0.27
Refresco	10	T.	0.00	0.16	0.00	0.43	0.75	0.20	0.04	T.	0.52	0.00	0.00	0.75
Potrerillos	4	0.83	0.55	0.24	T.	0.06	0.87	T.	0.98	T.	T.	0.00	T.	0.98
Caldera	25	0.06	T.	T.	0.03	0.79	1.02	0.95	0.40	0.21	0.14	0.13	0.07	1.02
Copiapo	6	0.00	0.00	0.00	T.	0.45	0.94	0.08	0.19	0.04	T.	T.	0.00	0.94
La Pampa	8	0.04	0.20	0.32	0.00	7.40	1.77	2.97	3.05	1.30	0.13	0.00	0.30	7.40
Punta Tortuga	25	T.	0.04	0.96	0.15	4.43	5.55	4.00	2.06	0.71	0.09	0.55	0.04	5.55
Ovalle	12	T.	T.	T.	0.08	4.74	1.46	2.03	2.03	1.64	0.09	0.51	T.	4.74
Combarbala	6	0.00	0.00	0.03	0.16	2.36	1.83	2.20	2.20	0.59	0.00	0.00	0.00	2.36
Los Andes	14	0.11	T.	1.16	0.98	3.50	3.25	2.01	1.57	1.80	0.91	0.71	1.87	3.50
Punta Angeles	25	0.24	0.07	1.42	2.47	6.75	7.32	3.22	2.79	2.97	1.61	1.42	0.99	7.32
Santiago	14	0.23	0.14	0.60	0.96	2.89	2.86	2.26	1.31	1.75	1.03	1.15	0.90	2.89
El Teniente	13	1.32	0.75	2.27	4.79	5.61	6.25	5.00	4.09	3.33	3.72	4.91	0.80	6.25
San Fernando	14	0.57	0.17	1.22	2.35	5.83	6.56	3.91	4.32	2.87	1.94	2.26	1.67	6.56
Talca	13	1.09	0.34	1.60	3.80	3.23	3.94	3.39	2.84	3.96	1.50	2.34	0.98	3.96
Punta Carranza	23	1.10	0.85	2.08	1.93	6.09	4.13	4.09	3.00	2.91	1.02	1.81	1.73	6.09
Chillan	7	1.15	1.77	2.43	1.44	3.51	3.65	2.59	2.64	2.67	1.33	1.38	2.20	3.65
Punta Tumbes	24	0.55	1.93	2.11	2.35	2.83	2.04	1.65	1.88	1.97	0.97	0.87	0.96	2.83
Concepcion	14	1.72	0.91	2.26	2.37	5.39	4.97	3.87	2.79	2.61	1.97	2.20	1.71	5.39
Punta Lavapie	20	1.06	1.42	4.27	1.71	2.05	3.22	2.46	1.70	1.41	1.30	1.78	1.32	4.27
Contulmo	14	2.85	1.23	3.84	3.87	5.89	3.90	7.94	4.11	3.18	1.76	4.62	3.89	7.94
Los Guindos	7	2.83	2.83	6.57	8.29	8.85	4.37	5.71	4.68	3.99	3.64	6.54	3.78	8.85
Lonquimay	10	1.37	1.38	3.40	2.33	4.67	5.07	4.84	2.94	2.80	2.01	2.66	2.85	5.07
Maximum precipitation in 24 hours (inches)														
Temuco	12	1.53	0.91	1.82	2.02	3.06	1.96	4.99	2.00	2.26	0.92	2.75	3.99	4.99
Panguipulli	9	3.25	2.82	3.67	4.21	4.54	3.35	3.78	3.44	2.78	2.06	4.55	3.17	4.55
Valdivia	14	1.91	2.13	2.05	4.15	4.41	4.01	6.25	3.48	3.86	1.77	5.16	3.84	6.25
Casapangue	7	3.58	3.80	4.72	7.13	4.65	6.22	6.69	3.82	3.31	2.18	5.51	3.35	7.13
Puerto Montt	13	3.07	1.75	1.81	3.70	2.60	3.26	2.77	2.15	2.76	1.81	2.04	1.85	3.70
Punta Corona	24	2.89	2.74	3.35	4.75	3.70	2.90	3.28	3.94	2.13	1.95	2.75	2.30	4.75
Isla Guafo	17	1.57	1.69	1.21	3.04	1.84	2.30	1.69	2.55	1.09	1.03	0.87	1.11	3.04
Melinka	11	3.56	4.17	3.62	3.04	4.09	4.06	3.07	3.15	3.08	2.88	3.56	2.67	4.17
Cabo Raper	9	1.70	1.42	1.18	1.42	1.36	1.72	1.81	1.55	1.65	1.19	1.32	1.88	1.88
Punta Dungeness	21	1.18	0.78	1.46	2.50	0.70	1.14	0.85	0.79	0.56	0.58	0.46	0.87	2.50
Evanjelistas	25	2.88	2.76	2.91	4.19	3.18	4.06	2.84	5.38	3.28	2.44	2.38	2.40	5.38
Bahia Felix	9	4.16	4.42	4.84	4.79	3.76	3.94	3.91	4.74	4.51	4.85	3.60	4.13	4.85
Punta Arenas	20	2.17	1.02	2.40	1.41	1.83	1.75	2.21	1.27	1.67	1.38	0.69	1.43	2.40
Bahia Harris	8	0.91	3.15	1.10	1.18	2.52	0.91	0.79	0.79	0.83	1.10	0.93	1.18	3.15
Mean number of days with precipitation [1]														
Tacna	6	1	1	(2)	1	1	0	2	2	4	1	1	1	15
Ollague	3	4	4	1	0	0	(2)	1	(2)	(2)	0	1	1	12
Caldera	25	(2)	0	0	(2)	1	1	1	1	1	(2)	(2)	(2)	5
Copiapo	14	0	0	0	(2)	1	1	1	(2)	(2)	(2)	0	0	4
La Pampa	8	(2)	(2)	(2)	0	2	2	1	1	(2)	(2)	0	(2)	6
Punta Tortuga	25	(2)	(2)	(2)	1	3	4	3	3	1	1	(2)	(2)	16
Ovalle	12	0	0	0	(2)	2	3	2	2	1	(2)	(2)	(2)	10
Combarbala	6	0	0	1	(2)	2	5	3	2	1	0	0	0	14
Los Andes	19	(2)	0	1	2	5	6	5	4	3	2	1	(2)	29
Punta Angeles	25	(2)	(2)	1	3	6	8	7	6	4	3	1	1	40
Santiago	24	(2)	(2)	1	3	7	10	8	7	5	4	2	1	48
El Teniente	13	1	1	2	4	7	9	8	9	5	3	3	1	53
San Fernando	14	(2)	(2)	1	3	9	9	8	8	5	5	3	1	52
Talca	13	(2)	1	2	3	10	9	9	8	5	4	3	1	55
Punta Carranza	23	1	1	2	5	5	12	10	9	6	3	3	1	58
Chillan	9	2	2	4	6	11	15	10	12	9	5	5	2	83
Punta Tumbes	25	1	1	3	6	7	14	13	11	9	5	4	2	76
Concepcion	20	2	2	4	8	14	15	14	14	11	7	5	4	100
Punta Lavapie	20	2	3	5	9	14	17	15	14	10	7	6	4	106
Contulmo	14	5	5	8	12	18	18	17	16	14	10	10	7	140
Los Guindos	7	4	4	8	9	16	18	14	16	12	9	9	5	124
Lonquimay	10	5	5	9	11	18	17	18	15	12	11	11	7	139
Temuco	12	5	5	9	13	16	16	15	15	12	9	9	7	131
Panguipulli	9	6	6	12	13	18	17	17	17	14	11	11	9	151
Valdivia	24	7	7	12	15	21	22	21	20	17	12	12	10	176
Casapangue	7	4	7	11	14	18	16	14	18	9	8	9	8	136
Puerto Montt	12	12	11	12	18	24	22	20	21	16	13	16	15	200
Punta Corona	25	9	10	14	16	21	21	21	21	16	13	14	13	189
Mean number of days with precipitation														
Isla Guafo	17	20	18	20	22	25	24	25	25	20	18	21	20	258
Melinka	11	12	10	13	17	20	17	19	18	15	12	15	16	184
Cabo Raper	9	23	22	24	25	27	24	24	23	22	19	26	26	285
Punta Dungeness	17	7	6	6	7	7	5	6	5	4	4	5	7	69
Evanjelistas	25	28	25	28	27	26	25	26	26	26	26	27	28	318
Bahia Felix	9	29	26	28	28	27	26	27	27	25	25	28	29	325
Punta Arenas	19	9	8	9	12	11	9	11	8	9	6	9	10	111
Bahia Harris	9	21	19	21	22	21	18	20	19	16	12	16	21	226
Mean number of days with snow														
Tacna	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Refresco	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potrerillos	4	0.0	0.0	0.0	0.0	0.8	0.8	1.0	0.0	0.2	0.0	0.0	0.0	2.8
Los Andes	9	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.7	0.1	0.0	0.0	0.0	1.5
Santiago	9	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.8	0.0	0.0	0.0	0.0	1.1
El Teniente	9	0.1	0.0	0.1	0.8	4.1	8.0	7.7	7.8	4.1	1.6	1.0	0.1	35.4
Lonquimay	7	0.0	0.0	0.1	0.1	4.0	7.4	8.0	8.6	5.7	1.6	0.7	1.0	37.2
Temuco	5	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.4	0.0	0.0	0.0	0.0	1.2
Valdivia	7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2
Puerto Montt	6	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.3	0.0	0.0	0.0	1.1
Punta Corona	9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.4
Morro Lobos	9	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.1	0.0	0.0	0.0	0.6
Isla Guafo	9	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.1	0.0	0.0	0.6
Melinka	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Punta Dungeness	9	0.0	0.0	0.0	0.1	0.6	1.1	1.9	1.2	0.4	0.0	0.0	0.0	5.3
Evanjelistas	9	0.1	0.1	0.3	0.7	3.2	4.6	6.1	4.6	4.2	1.4	1.1	0.8	27.2
Punta Arenas	7	0.0	0.0	0.1	1.6	3.9	4.9	6.9	5.3	3.4	2.0	1.1	0.3	29.5

[1] Arica, 3(?) days in 17 years; Iquique, 20 days in 25 years; Antofagasta, 26 days in 16 years; Refresco, 14 days in 10 years; Potrerillos, 13(?) days in 4 years. [2] Less than 0.5 inch.

Wind.—Over the greater part of Chile the winds have a westerly component throughout the year. In the northern region the prevalence of southwest winds is very striking; south of Santiago to Temuco the prevailing winds come from south, southwest, or west, and from Valdivia southward along the coast they blow from north, northwest, or west. At the stations listed in Table 20 there is little or no seasonal variation in wind direction except the changes from winter to summer at Los Andes (SW. to E.), El Teniente (W. to E.), Talca (S. to N.), and Temuco (W. to NE.).

At Isla Mocha, Isla Guafo, and Evanjelistas, stations freely exposed to the winds from the western ocean, and Punta Dungeness, on the Atlantic coast, the average wind force is slightly above 4 of the Beaufort scale without material change for seasons; elsewhere wind velocities are uniformly low.

Gales are frequent in the region of the stormy westerly winds; at Isla Guafo and Evanjelistas the average annual number of days with gale (wind force 8 or more on the Beaufort scale) is about 80.

TABLE 20.—*Wind data, Chile*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
		Prevailing wind direction [1]												
Tacna	6	sw.	s., sw.	s., sw.	s.	s.	s.	sw.	sw.	s.	sw.	sw.	s., sw.	sw.
Arica	9	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Iquique	14	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Antofagasta	9	s., sw.	s.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Refresco	11	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Punta Tortuga	14	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Ovalle	14	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Los Andes	14	sw.	sw.	e., sw.	e.	e.	e.	e.	e.	e.	e.	sw.	sw.	e.
Punta Angeles	14	sw.	sw.	sw.	sw.	sw.	se.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Santiago	14	sw.	s.	s.	sw.	sw.	sw.	sw.	sw.	sw.	s.	s.	sw.	sw.
El Teniente	13	w.	w.	w.	w.	w.	e.	e.	e.	w.	w.	w.	w.	w.
Talca	12	s.	s.	s.	s.	n.	n.	n.	s.	s.	s.	s.	s.	s.
Punta Carranza	14	sw.	sw.	sw.	sw.	n., sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Punta Tumbes	14	s.	s.	s.	s.	n.	s.	n., s.	s.	s.	s.	s.	s.	s.
Lonquimay	8	sw.	sw.	sw.	sw.	sw.	w.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Temuco	9	w.	w.	w.	w.	ne.	ne.	ne.	ne.	w.	w.	w.	w.	w.
Valdivia	11	nw.	w., nw.	w.	n., nw.	nw.	nw.	nw.	nw.	nw.	nw.	w.	w.	w.
Punta Corona	14	w.	sw.	n.	n.	n.	n.	n.	n.	w.	w.	w.	w., nw.	n.
Melinka	11	n.	n.	n.	n.	n.	n.	n.	n.	n.	n.	n.	n.	n.
Punta Dungeness	14	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Evanjelistas	14	w., nw.	w.	nw.	w.	nw.	w.	w.	sw.	nw.	nw.	nw.	w.	w.
Punta Arenas	13	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
		Mean wind force, Beaufort scale 0–12												
Iquique	6	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.2	1.2	1.1	1.2
Refresco	6	0.7	0.9	0.8	0.9	1.0	1.3	1.1	1.0	1.0	0.8	0.6	0.6	0.9
Punta Tortuga	6	2.2	2.5	2.2	2.0	2.1	2.1	2.1	2.2	2.3	2.4	2.4	2.5	2.2
Punta Angeles	6	1.2	1.3	1.1	0.9	0.9	1.0	0.9	1.0	1.1	1.1	1.4	1.4	1.1
Santiago	6	1.2	1.1	0.9	0.7	0.6	0.5	0.5	0.6	0.8	1.0	1.1	1.2	0.8
Punta Carranza	6	2.0	1.9	1.9	2.0	2.4	2.2	2.5	2.4	2.4	2.2	2.4	2.4	2.2
Isla Mocha (West)	6	4.4	3.9	3.4	3.8	4.3	4.1	4.6	4.5	4.2	4.2	4.2	3.6	4.1
Temuco	5	1.8	1.8	1.5	1.5	1.5	1.7	1.6	1.7	1.5	1.6	1.7	1.7	1.6
Valdivia	3	0.5	0.5	0.3	0.5	0.6	0.5	0.5	0.6	0.6	0.3	0.4	0.4	0.5
Isla Guafo	6	4.5	4.5	3.8	4.3	4.6	4.5	4.5	5.0	4.1	3.8	4.4	4.6	4.4
Melinka	4	2.2	2.2	2.1	2.5	2.6	2.8	2.9	3.0	2.9	2.4	2.6	2.6	2.6
Punta Dungeness	5	4.6	4.4	4.6	4.8	4.4	4.2	4.4	4.2	3.7	3.7	4.1	4.2	4.3
Evanjelistas	6	4.2	4.2	4.3	4.6	4.4	4.4	4.4	4.6	4.2	3.8	4.5	4.5	4.3
Punta Arenas	5	3.1	3.0	2.6	2.7	2.3	2.2	2.5	2.8	2.7	2.8	2.8	3.0	2.7
		Mean number of days with gale [2]												
Iquique	14	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.4
Refresco	11	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.5
Punta Tortuga	14	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.4
Punta Angeles	14	0.6	0.1	0.2	0.1	0.2	0.0	0.0	0.1	0.1	0.1	0.6	0.9	3.0
Santiago	14	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Punta Carranza	14	1.2	2.7	1.5	0.8	1.6	0.7	1.4	1.1	1.0	0.9	1.6	0.8	15.3
Isla Mocha (West)	7	4.5	3.7	2.5	3.8	5.3	4.5	4.7	4.6	2.5	2.6	4.5	2.8	46.0
Temuco	8	0.0	0.0	0.1	0.1	0.4	0.2	0.5	0.2	0.1	0.0	0.0	0.0	1.6
Valdivia	10	0.1	0.0	0.0	0.4	0.4	0.0	0.3	0.1	0.1	0.0	0.0	0.0	1.4
Isla Guafo	13	5.0	5.0	5.1	6.9	9.2	8.8	9.0	10.3	6.1	4.5	5.5	5.1	80.5
Melinka	10	0.0	0.0	0.0	0.7	0.5	0.0	0.9	0.7	0.4	0.1	0.1	0.4	3.8
Punta Dungeness	12	5.5	5.8	7.0	6.2	6.7	4.9	5.3	4.9	2.6	3.8	4.8	3.2	60.7
Evanjelistas	14	7.4	8.1	9.1	6.8	7.8	5.9	6.4	5.9	6.6	6.5	6.9	5.2	82.6
Punta Arenas	13	2.8	1.5	1.4	1.2	0.5	1.3	1.8	1.5	2.0	2.2	3.0	2.4	21.6

[1] Observations at 7 a. m., 2 p. m., and 9 p. m.
[2] Wind force equal to or exceeding 8 of the Beaufort scale.

TABLE 21.—*Fog and thunderstorm data, Chile*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean number of days with fog														
Arica	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iquique	14	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.3
Antofagasta	9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Refresco	11	0.0	0.0	0.0	0.0	0.2	0.4	0.4	0.4	0.3	0.0	0.0	0.2	1.9
Caldera	14	0.1	0.0	0.1	0.3	1.7	1.8	1.5	1.4	0.4	0.5	0.4	0.4	8.6
Punta Tortuga	14	0.5	0.4	3.4	5.1	5.6	4.6	6.4	5.6	3.5	1.4	1.9	1.2	39.6
Ovalle	5	1.4	2.8	7.8	7.6	6.6	3.4	4.2	4.4	5.0	5.0	2.6	2.0	52.8
Punta Angeles	14	5.4	6.6	8.6	8.2	7.6	4.4	5.8	5.9	5.1	4.6	4.5	5.7	72.4
Santiago	14	6.1	2.8	6.2	11.6	13.6	12.9	13.5	9.9	6.7	3.6	2.1	4.8	93.8
Punta Carranza	14	8.6	7.4	9.9	9.0	7.4	3.8	4.5	5.3	3.1	5.1	5.4	6.3	75.8
Punta Tumbes	14	8.7	8.6	12.0	11.1	8.5	5.9	9.1	6.4	3.9	6.3	5.9	7.4	93.8
Lonquimay	9	8.2	10.1	15.4	12.1	6.7	5.7	5.1	4.6	3.0	3.6	3.7	4.8	83.0
Temuco	8	5.8	8.6	10.0	8.4	8.5	6.8	8.1	7.1	5.5	7.2	6.1	5.4	87.5
Valdivia	11	1.5	2.6	6.8	8.5	9.4	8.5	6.2	9.3	5.3	2.6	0.5	0.4	61.6
Punta Corona	14	6.0	5.5	6.9	5.4	4.4	3.7	3.1	4.2	2.2	3.1	4.1	5.1	53.7
Melinka	11	0.5	1.2	1.6	1.3	1.3	0.4	0.8	0.2	0.8	0.7	0.5	0.5	9.8
Punta Dungeness	14	1.2	0.8	1.5	1.1	2.2	2.4	3.4	2.8	2.6	1.4	0.9	1.4	21.7
Evanjelistas	14	6.1	6.8	5.8	3.5	4.0	3.0	4.0	2.3	3.1	6.4	7.3	8.6	60.9
Punta Arenas	12	0.1	0.0	0.4	0.8	1.0	1.3	2.3	1.0	0.9	0.6	0.2	0.2	8.8
Mean number of days with thunderstorm														
Tacna	6	1.1	1.7	0.8	0.2	0.0	0.0	0.2	0.0	0.3	0.5	0.3	0.0	5.1
Arica	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iquique	14	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.5
Antofagasta	9	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Refresco	11	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Caldera	14	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Punta Tortuga	13	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.7
Ovalle	12	0.1	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
Punta Angeles	14	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.0	0.1	0.0	0.1	0.0	0.9
Santiago	14	0.2	0.1	0.5	0.3	0.4	0.3	0.1	0.1	0.6	0.1	0.4	0.0	3.1
Talca	12	0.1	0.0	0.2	0.1	0.2	0.2	0.2	0.2	0.0	0.0	0.3	0.0	1.5
Punta Carranza	14	0.0	0.0	0.1	0.1	0.6	0.1	0.3	0.0	0.2	0.1	0.0	0.0	1.5
Punta Tumbes	14	0.1	0.0	0.0	0.1	0.8	0.3	0.2	0.2	0.1	0.0	0.0	0.1	1.9
Punta Lavaple	13	0.2	0.1	0.2	0.1	0.4	0.5	0.2	0.1	0.1	0.1	0.2	0.1	2.3
Lonquimay	9	2.7	2.2	2.0	0.3	0.8	0.4	0.3	0.2	0.2	1.5	0.9	1.3	12.8
Temuco	9	0.2	0.0	0.3	0.2	0.3	0.3	0.0	0.2	0.0	0.6	0.1	0.2	2.4
Valdivia	11	0.0	0.2	0.3	0.5	0.6	1.2	0.8	0.8	0.3	0.2	0.0	0.0	4.9
Punta Corona	14	0.2	0.1	0.6	0.7	0.7	0.6	0.5	0.2	0.2	0.2	0.1	0.2	4.3
Melinka	11	0.5	0.3	0.5	0.8	0.6	1.0	0.9	0.7	0.1	0.0	0.2	0.2	5.8
Punta Dungeness	14	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.8
Evanjelistas	14	0.1	0.3	0.1	0.3	0.5	0.2	0.1	0.0	0.1	0.1	0.0	0.0	1.8
Punta Arenas	12	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3

Climatic data for the Juan Fernandez Islands (33° 27′ S., 78° 50′ W.) are given separately in Table 22.

TABLE 22.—*Climatological data for Juan Fernandez Islands (Mas a Tierra)*

	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	10	70.5	70.9	70.0	67.3	64.8	60.6	59.5	59.5	59.2	61.0	64.4	68.4	64.7
Mean minimum	10	60.1	60.8	60.4	58.1	55.2	51.6	50.7	49.8	49.3	50.7	54.1	57.6	54.9
Mean	10	65.3	65.8	65.2	62.7	60.0	56.1	55.1	54.6	54.2	55.8	59.2	63.0	59.8
Mean, 7 a. m., 2 p. m., 9 p. m	11	65.8	66.0	65.3	62.8	60.6	56.7	55.9	55.0	54.5	56.3	59.4	63.3	60.1
Highest	14	82	82	81	76	77	73	68	70	70	71	80	81	82
Lowest	12	50	54	51	50	44	43	40	39	41	43	46	50	39
Relative humidity														
Mean, 7 a. m., 2 p. m., 9 p. m	11	73	73	74	76	78	76	81	79	77	77	76	73	76
Mean, 2 p. m	11	69	69	70	74	76	75	77	76	73	73	72	69	73
Cloudiness														
Mean, 3 observations	11	6.4	6.4	6.5	6.6	6.8	7.3	6.9	6.6	6.6	6.8	6.4	6.2	6.6
Precipitation														
Mean	17	0.92	1.37	1.94	3.82	6.47	6.96	5.98	4.40	3.14	1.84	1.97	0.66	39.47
Maximum in 24 hours	17	1.74	1.99	2.39	2.26	3.28	4.17	2.56	2.13	2.42	1.69	2.77	1.66	4.17
Mean number of rainy days	17	6	8	10	12	16	18	17	15	12	8	8	5	135
Prevailing wind direction	12	s.	s.	s.	w.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Mean number of days with fog	11	1.5	1.4	1.7	2.4	2.2	2.4	2.8	2.6	1.7	1.2	1.3	2.3	25.5
Mean number of days with thunderstorm	12	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.4

ARGENTINA

The extensive area of Argentina, about 1,150,000 square miles, is generally divided for climatic study into four regions—littoral, mediterranean, Andean, and Patagonian. The littoral region includes the territory contiguous to the eastern rivers and the coastal plain southward to Patagones; the meridian of 62° west marks in a very general way its western limit. With the exception of the hills in the extreme northeast (Misiones), the elevation is generally less than 400 feet. The mediterranean region, paralleling the littoral area and extending west approximately to a line from Rivadavia to Cipolletti, lies from 300 to 1,600 feet above the sea. The Andean division, which has been given nearly the same north-south extent as the preceding divisions, has a wide range in elevation, from about 1,700 feet (La Rioja) to more than 20,000 feet at the summits of the highest peaks (Mount Aconcagua, near Mendoza, 23,393 feet), and presents a highly diversified surface—mountains, high plateaus, and valleys. South of these three divisions, or south of latitude 40°, lies the Patagonian region, stretching from the Atlantic Ocean to the crests of the southern Andes, which have an elevation of about 10,000 feet in northern Patagonia, but gradually decrease in height toward the south, ending in the highlands of Tierra del Fuego.

The climatic tables presented were compiled for the most part from three valuable works by W. G. Davis: Clima de la República Argentina (1902), Clima de la República Argentina (1909), and Servicio Meteorológico Argentino; Historia y Organizacion[8] (1914)—all issued by the Ministerio de Agricultura, Buenos Aires. Data published in the Boletin Mensual of the Oficina Meteorológica Nacional made possible a partial revision that includes records to the end of the year 1923.

Temperature.—The distribution of temperature may be outlined very briefly by annual means for parts of the several divisions as follows: Littoral, 70° F. near the northern border, 63° at Buenos Aires, and slightly below 60° in the south; mediterranean, 75° at Rivadavia, 70° at Santiago del Estero, and 60° or lower in the southern pampas; Andean, extremes of 68° at La Rioja and 44° at Puente del Inca; Patagonian, 57° at Puerto Madryn, 50° at Deseado, and 40° at Ushuaia, on the southern coast of Tierra del Fuego.

The marked degree to which temperature distribution is influenced by the Andes stands out in striking manner on the chart of annual isotherms. Over the greater part of the country west of the sixty-fifth meridian the annual isotherms have the highly abnormal north-south direction; east of that line, at moderate elevations, the course approaches the normal east-west direction.

On the chart of annual isotherms published by Davis are found, among others, the following interesting features: In the vicinity of La Quiaca, on the northern border, the change in mean annual temperature from east to west amounts to 22° (72° to 50°) within the short distance of about 100 miles. From this region of steep temperature gradient the annual isotherm of 68° (20° C.) runs southward to latitude 30° and then bends rather sharply eastward; the isotherm of 59° (15° C.) takes a south-southwest direction as far as latitude 35°, where it begins a wide, irregular loop that passes south and east of Bahia Blanca, curves inland to the vicinity of Trenque Lauquen, and finally takes a course approximately eastward, reaching the coast again near latitude 36°; the

[8] This publication contains 35 charts showing distribution of pressure, wind, temperature, and precipitation.

isotherm of 50° (10° C.) parallels that of 59° to latitude 35°, runs south to latitude 40° and then south-southeast to the vicinity of Deseado.

January is the warmest month in all sections, but at a few scattered stations there is a slight increase in mean temperature in the following month. June and July, the coldest months, have temperature normals that generally differ by less than 1°. The following values give contrasts in temperature means for extreme months at selected stations: Rivadavia, 86.4° and 60.6°; Buenos Aires, 73.8° and 49.3°; Cipolletti, 72.6° and 41.8°; Colonia Sarmiento, 64.8° and 37.4°; La Quiaca, 55.9° and 37.8°; Puente del Inca, 55.2° and 32.2°; and Ushuaia, 48.6° and 30.6°.

Maximum temperature readings are extraordinarily high at some of the northern stations (Rivadavia, 120°; Ceres and Tucuman, 118°; La Rioja, 116°; Santiago del Estero and San Juan, 115°; other stations, 110° to 114°); and above 100° over the coastal region from Buenos Aires to Deseado. At the elevated stations and over nearly all of Patagonia the extreme records range from 90° to about 100°. The lowest maxima for the entire country are 82° at Puente del Inca and 81° at Ushuaia.

Temperatures below freezing have been reported from all regions and temperatures below 20° except in the northern parts of the littoral and mediterranean regions. Zero or subzero temperatures have occurred at stations along the western border from La Quiaca to Colonia 16 de Octubre, in interior Patagonia, and in Tierra del Fuego. The extreme minimum for Argentina is −27° at Colonia Sarmiento and Buen Pasto (location unknown, see footnote to Table 24).

The values of daily range in temperature show marked contrast between conditions prevailing in the mediterranean and Andean regions on the one hand and the littoral and Patagonian regions on the other. In the former areas the mean difference between daily temperature extremes averages for the year 25° or more, exceeding 35° at Malargue, Tinogasta, and La Quiaca; in the latter areas the average difference is generally below 20°, with lowest values at Buenos Aires (13.0°) and Ushuaia (15.7°).

The remarkable daily range in temperature at La Quiaca is well worthy of special mention, and detailed representation as given in Table 23.

TABLE 23.—*Mean daily range in temperature at La Quiaca (11,358 feet)*[1]

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean maximum temperature	70.7	71.2	70.7	69.1	63.7	61.3	60.1	64.0	68.9	72.1	73.2	73.6	68.2
Mean minimum temperature	39.9	40.6	38.3	31.3	21.4	15.1	15.6	20.5	26.2	31.1	36.5	39.4	29.7
Mean range in temperature	30.8	30.6	32.4	37.8	42.3	46.2	44.5	43.5	42.7	41.0	36.7	34.2	38.5
Mean cloudiness	5.8	5.4	4.5	2.9	2.2	1.8	2.3	2.8	2.9	3.7	4.3	5.4	3.8
Mean precipitation (inches)	3.27	2.36	2.01	0.28	0.00	0.00	0.04	0.00	0.00	0.20	1.06	2.13	11.35

[1] Based on record for 11 years.

Even in the season of moderate precipitation from November to March, inclusive, when the mean cloudiness is 5.1, the daily range in temperature averages 31° to 37° F.; during the remainder of the year, much of which is rainless with mean cloudiness 2.4, the amplitude of daily temperature variation shows extraordinary values culminating in 46.2° for June. The amount of this daily range in temperature corresponds very closely to the difference between mean daily maximum in May (74.1°) and mean daily minimum in February (26.6°) at Washington, D. C., or to the difference between mean daily maximum in July (88.0)° and mean daily minimum in January (42.8°) at Charleston.

The powerful influence of nocturnal radiation at the elevation of 11,000 feet gives this station, which lies within the Tropics (latitude 22° S.), a mean minimum temperature of 15° in June. This low value is approximately the same as the January mean minimum at Denver, Omaha, Milwaukee, Buffalo, and Portland, Me.

Frost days, minimum temperature 32° F. or lower, are practically unknown in the extreme northern littoral region; over the remainder of the country the mean annual number of such days ranges from 10 to 44 (Azul) in the southern littoral region, from 8 to 81 (Cipolletti) in the mediterranean region, from 9 to 169 (La Quiaca) in the Andean region, and from 35 to 123 (Colonia 16 de Octubre) in the Patagonian region exclusive of Tierra del Fuego. Unfortunately, daily temperature records are not available for a period of time sufficient to give reliable information on the frequency of ice days, maximum temperature 32° or lower.

The marked temperature changes accompanying the "zondas" of the Andean region and the "pamperos" of the littoral and mediterranean regions will be mentioned later in the presentation of data on wind.

TABLE 24.—*Temperature data (°F.), Argentina*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Littoral region		Mean maximum temperature												
Corrientes	39	92.7	91.8	89.1	80.6	74.5	70.0	70.9	73.0	78.1	82.4	87.1	91.2	81.8
Paso de los Libres	13	94.3	94.5	90.7	79.9	72.5	67.8	68.2	69.8	75.4	80.4	86.9	91.2	81.0
Ceres	16	93.9	92.5	88.7	80.2	73.8	68.9	68.9	70.5	77.4	82.8	87.1	90.7	81.3
Rosario	16	88.5	87.1	81.0	73.9	66.4	60.6	62.1	63.1	68.9	73.8	80.6	85.3	74.3
Concepcion del Uruguay	11	91.4	90.5	85.3	76.1	67.6	62.4	60.6	64.0	69.8	75.9	82.2	87.4	76.1
Buenos Aires [1]	10	81.9	81.0	77.4	69.6	63.1	57.2	56.5	57.4	63.7	68.2	74.3	79.7	69.2
Do [1]	13	84.7	82.6	78.8	72.1	64.4	57.0	56.8	60.1	64.0	68.7	75.7	81.9	70.6
Trenque Lauquen	9	89.1	85.3	81.1	71.8	63.3	57.7	58.1	61.2	66.6	72.9	79.3	85.1	72.6
Azul	14	86.7	83.8	79.2	71.1	62.1	56.7	55.8	58.1	63.5	69.8	76.5	82.2	70.5
Mar del Plata	9	77.5	76.6	73.6	67.5	59.9	54.3	53.4	54.5	57.6	61.9	67.5	74.7	64.9
Bahia Blanca	42	88.2	83.3	79.9	72.0	63.0	56.8	57.6	59.9	65.7	71.4	78.8	84.4	71.8
Patagones	15	86.2	81.9	79.3	70.0	60.8	54.7	54.3	57.4	63.9	70.2	77.4	82.8	69.9
Mediterranean region														
Rivadavia	8	102.2	99.1	94.5	87.8	83.1	75.2	76.1	84.6	91.2	92.1	99.0	102.2	90.6
Santiago del Estero	28	96.8	94.3	89.4	82.2	75.0	68.9	69.6	74.8	82.0	86.5	91.6	93.9	83.8
Cordoba	41	87.1	86.0	81.3	74.7	69.1	63.5	64.9	68.4	72.3	76.6	81.1	84.9	75.8
Victorica	9	93.2	89.2	83.3	73.9	64.6	59.5	60.4	63.7	67.6	74.8	83.7	88.3	75.2
Cipolletti	9	88.9	85.8	80.8	71.1	61.3	54.3	55.4	61.0	66.4	70.7	80.8	84.0	71.7
Choele Choel	11	93.0	86.7	85.1	72.7	62.2	56.7	57.2	61.5	67.3	73.4	83.1	87.6	73.9
Andean region														
La Quiaca	11	70.7	71.2	70.7	69.1	63.7	61.3	60.1	64.0	68.9	72.1	73.2	73.6	68.2
Humahuaca	11	78.4	79.5	79.0	76.6	69.6	65.7	66.6	69.8	76.3	78.3	79.7	81.0	75.0
Salta	10	82.8	81.9	79.0	73.6	70.2	68.7	70.2	70.3	77.5	79.3	80.4	81.0	76.2
Tucuman	40	89.2	87.1	82.4	76.1	70.3	66.4	67.8	71.2	78.8	82.2	84.6	86.4	78.5
Tinogasta	11	92.5	91.6	88.5	82.0	73.6	69.1	69.1	72.7	81.1	86.2	89.6	92.1	82.3
La Rioja	10	90.3	90.3	86.7	80.6	70.7	66.9	67.6	72.9	79.3	82.6	86.7	90.0	80.4
San Juan	39	92.3	90.3	85.3	76.8	67.3	61.9	62.8	66.2	73.2	79.3	85.6	90.3	77.6
Mendoza	23	90.3	87.1	82.0	73.0	64.9	58.6	59.2	63.1	69.3	76.3	83.5	88.0	74.6
Puente del Inca	7	69.8	68.4	65.8	59.4	51.8	41.9	43.0	46.0	49.3	56.7	60.8	64.2	56.4
San Luis	10	90.5	88.5	83.5	71.6	66.6	59.4	61.3	64.4	72.0	76.6	81.7	86.2	75.2
Malargue	8	84.6	82.9	77.0	71.1	63.1	51.8	54.5	58.1	63.1	67.5	76.6	83.5	69.5
Chos Malal	14	88.0	84.6	79.9	69.8	61.0	54.3	55.0	58.6	64.4	70.9	78.4	82.4	70.6
Bariloche	5	75.6	71.4	66.9	58.8	52.0	45.0	44.6	46.8	50.4	55.4	63.9	63.7	57.9
Patagonian region														
Puerto Madryn	8	81.1	81.7	75.4	70.2	61.5	54.0	54.5	57.6	61.9	65.5	73.8	78.8	68.0
Colonia 16 de Octubre	14	73.9	72.3	66.6	58.6	51.4	44.4	43.9	48.4	54.5	58.5	64.2	69.3	58.8
Colonia Sarmiento	8	77.7	77.4	70.0	62.4	53.8	46.4	45.7	50.7	57.0	64.2	69.4	74.8	62.5
Deseado	8	72.3	68.7	67.8	59.5	52.2	45.3	46.2	48.6	55.2	61.5	66.0	66.4	59.1
Santa Cruz	9	71.8	70.3	66.9	57.2	49.1	42.6	42.8	45.7	55.0	60.4	65.5	68.0	57.9
Ushuaia	6	56.5	56.8	54.0	47.5	42.8	37.6	37.8	41.5	46.4	50.9	53.4	54.7	48.3

[1] In this table and others following data are given, first, for the locations in the city proper and, second, for the suburban station at Chacarita, which was established in 1906.

TABLE 24.—*Temperature data (°F), Argentina*—Continued

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Littoral region		Mean minimum temperature												
Corrientes	29	70.5	70.5	68.7	62.6	56.8	53.1	53.1	52.5	56.8	60.1	64.8	68.9	61.5
Paso de los Libres	13	65.5	66.2	64.6	57.9	52.0	48.9	49.3	48.4	53.1	55.8	60.6	63.7	57.2
Ceres	16	63.7	63.0	60.6	55.0	49.1	44.1	42.4	42.4	48.0	52.9	58.1	61.7	53.4
Rosario	16	62.6	63.5	59.0	53.1	46.8	39.7	42.3	42.1	44.1	49.5	55.9	61.0	51.6
Concepcion del Uruguay	11	65.3	65.1	62.6	56.3	49.6	45.9	45.1	45.5	49.6	53.6	57.7	62.6	54.9
Buenos Aires	10	66.9	66.2	63.7	57.0	51.8	47.1	45.9	45.9	51.1	54.1	60.1	64.6	56.2
Do	13	63.5	62.2	59.4	53.6	46.4	40.5	40.8	42.1	46.6	49.8	54.9	60.1	51.7
Trenque Lauquen	9	57.9	56.7	53.8	48.7	41.9	36.5	36.3	36.9	42.8	47.3	52.3	57.4	47.4
Azul	14	55.4	54.7	50.7	46.4	40.6	36.9	36.1	36.3	40.8	44.6	49.1	53.2	45.4
Mar del Plata	9	57.4	57.0	55.2	50.7	44.6	40.1	40.1	39.7	43.2	46.2	50.4	54.3	48.2
Bahia Blanca	42	61.5	59.0	56.3	49.3	43.5	39.6	38.5	39.2	43.5	47.1	53.6	58.6	49.2
Patagones	15	59.9	57.9	55.4	50.4	44.1	39.6	38.1	39.0	43.2	47.5	52.2	57.0	48.7
Mediterranean region														
Rivadavia	8	70.5	68.9	66.0	62.1	54.0	45.9	45.7	47.8	57.0	61.5	65.8	69.8	59.6
Santiago del Estero	28	68.4	67.5	64.9	58.8	51.1	44.6	43.7	45.7	52.7	58.6	63.3	66.6	57.2
Cordoba	41	60.6	60.3	57.6	50.7	44.1	38.5	38.5	40.1	45.3	50.7	55.8	59.4	50.1
Victorica	9	58.6	56.7	54.0	46.0	40.1	33.8	33.4	34.5	40.3	46.9	51.6	56.1	46.0
Cipolletti	9	56.3	52.7	47.5	40.3	35.2	29.8	28.2	30.6	36.3	42.8	48.4	53.4	41.8
Choele Choel	11	59.0	54.9	53.1	45.7	42.1	37.2	35.1	37.0	41.0	44.8	51.3	56.5	46.5
Andean region														
La Quiaca	11	39.9	40.6	38.3	31.3	21.4	15.1	15.6	20.5	26.2	31.1	36.5	39.4	29.7
Humahuaca	11	46.2	45.5	44.4	37.9	30.6	26.2	25.9	28.8	33.6	38.5	42.6	45.9	37.2
Salta	10	58.8	60.3	59.0	52.5	45.0	41.4	39.0	41.7	48.9	53.4	57.7	59.5	51.4
Tucuman	40	66.0	65.8	63.3	57.4	50.7	44.6	42.8	43.2	50.7	57.2	61.3	64.2	55.6
Tinogasta	11	58.8	57.6	54.3	45.1	35.6	30.2	29.3	31.3	38.5	46.4	52.9	57.0	44.8
La Rioja	10	67.1	67.1	63.3	57.2	48.2	41.7	41.4	44.8	52.5	57.9	63.0	65.3	55.8
San Juan	39	63.3	62.4	57.9	49.1	41.5	35.1	34.5	37.8	44.4	51.1	55.8	61.5	49.5
Mendoza	23	60.1	59.4	55.2	47.3	40.6	36.0	35.1	37.8	43.9	49.8	54.3	57.6	48.1
Puente del Inca	7	40.6	39.4	36.9	32.4	30.9	22.6	21.6	23.5	27.3	32.0	35.4	38.5	31.8
San Luis	10	63.3	62.8	59.5	49.6	45.1	38.7	38.5	41.5	47.1	51.4	56.8	59.2	51.1
Malargue	8	47.7	45.7	41.5	36.5	28.2	21.6	19.4	23.4	28.4	34.5	40.1	44.2	34.3
Chos Malal	14	54.0	52.3	47.5	41.2	38.1	33.4	32.4	33.6	36.5	41.4	47.3	51.4	42.4
Bariloche	5	45.5	45.1	42.8	38.7	36.7	32.0	30.2	33.1	32.7	36.1	39.7	43.0	38.0
Patagonian region														
Puerto Madryn	8	56.5	57.0	52.5	46.9	40.8	35.8	34.5	36.3	39.6	44.6	45.7	53.8	45.3
Colonia 16 de Octubre	14	45.0	43.3	41.2	37.4	35.2	31.1	30.4	31.3	33.4	36.1	39.2	42.4	37.2
Colonia Sarmiento	8	51.8	51.1	47.1	41.4	36.3	30.9	29.1	33.3	36.3	41.0	45.5	47.5	40.9
Deseado	8	50.4	48.4	46.0	41.4	36.3	32.9	31.8	34.2	35.8	39.9	44.1	46.9	40.7
Santa Cruz	9	47.1	45.5	42.6	37.0	32.0	28.2	28.4	31.3	34.2	38.8	41.4	45.7	37.7
Ushuaia	6	40.8	39.9	37.0	32.5	28.2	23.7	23.7	25.7	30.9	34.2	36.1	38.1	32.6
Littoral region		Mean temperature (maximum+minimum÷2)												
Corrientes	39	81.6	81.2	78.9	71.6	65.6	61.6	62.0	62.8	67.4	71.2	76.0	80.0	71.7
Paso de los Libres	13	79.9	80.4	77.6	68.9	62.2	58.4	58.8	59.1	64.2	68.1	73.8	77.4	69.1
Ceres	16	78.8	77.8	74.6	67.6	61.4	56.5	55.6	56.4	62.7	67.8	72.6	76.2	67.3
Rosario	16	75.6	75.3	70.0	63.5	56.6	50.2	52.2	52.6	56.5	61.6	68.2	73.2	63.0
Concepcion del Uruguay	11	78.4	77.8	74.0	66.2	58.6	54.2	52.8	54.8	59.7	64.8	70.0	75.0	65.5
Buenos Aires	10	74.4	73.6	70.6	63.3	57.4	52.2	51.2	51.6	57.4	61.2	67.2	72.2	62.9
Buenos Aires [2]	13	74.1	72.4	69.1	62.8	55.4	48.8	48.8	51.1	55.3	59.2	65.3	71.0	61.1
Trenque Lauquen	9	73.5	71.0	67.4	60.2	52.6	47.1	47.2	49.0	54.7	60.1	65.8	71.2	60.0
Azul	14	71.0	69.2	65.0	58.8	51.4	46.8	46.0	47.2	52.2	57.2	62.8	67.7	57.9
Mar del Plata	9	67.4	66.8	64.4	59.1	52.2	47.2	46.8	47.1	50.4	54.0	59.0	64.5	56.6
Bahia Blanca [2]	42	74.8	71.2	68.1	60.6	53.2	48.2	48.0	49.6	54.6	59.2	66.2	71.5	60.4
Patagones	15	73.0	69.9	67.4	60.2	52.4	47.2	46.2	48.2	53.6	58.8	64.8	69.9	59.3
Mediterranean region														
Rivadavia	8	86.4	84.0	80.2	75.0	68.6	60.6	60.9	66.2	74.1	76.8	82.4	86.0	75.1
Santiagodel Estero	28	82.6	80.9	77.2	70.5	63.0	56.8	56.6	60.2	67.4	72.6	77.4	80.2	70.4
Cordoba [2]	41	73.8	73.2	69.4	62.7	56.6	51.0	51.7	54.2	58.8	63.6	68.4	72.2	63.0
Victorica	9	75.9	73.0	68.6	60.0	52.4	46.6	46.9	49.1	54.0	60.8	67.6	72.2	60.6
Cipolletti	9	72.6	69.2	64.2	55.7	48.2	42.0	41.8	45.8	51.4	56.8	64.6	68.7	56.8
Choele Choel	11	76.0	70.8	69.1	58.7	52.1	47.0	46.2	49.2	54.2	59.1	67.2	72.0	60.1
Andean region														
La Quiaca	11	55.3	55.9	54.5	50.2	42.6	38.2	37.8	42.2	47.6	51.6	54.8	56.5	48.9
Humahuaca	11	62.3	62.5	61.7	57.2	50.1	46.0	46.2	49.3	55.0	58.4	61.2	63.4	56.1
Salta [2]	10	70.8	71.1	69.0	63.0	57.6	55.0	54.6	56.0	63.2	66.4	69.0	70.2	63.8
Tucuman	40	77.6	76.4	72.8	66.8	60.5	55.5	55.3	57.2	64.8	69.7	73.0	75.3	67.1
Tinogasta	11	75.6	74.6	71.4	63.6	54.6	49.6	49.2	52.0	59.8	66.3	71.2	74.6	63.5
La Rioja	10	78.7	78.7	75.0	68.9	59.4	54.3	54.5	58.8	65.9	70.2	74.8	77.6	68.1
San Juan	39	77.8	76.4	71.6	63.0	54.4	48.5	48.6	52.0	58.8	65.2	70.7	75.9	63.5
Mendoza	23	75.2	73.2	68.6	60.1	52.8	47.3	47.2	50.4	56.6	63.0	68.9	72.8	61.3
Puente del Inca	7	55.2	53.9	51.4	45.9	41.4	32.2	32.3	34.8	38.3	43.4	48.1	51.4	44.0
San Luis	10	76.9	75.6	71.5	60.6	55.8	49.0	49.9	53.0	59.6	64.0	69.2	72.7	63.2
Malargue	8	66.2	64.3	59.2	53.8	45.6	36.7	37.0	40.8	45.8	51.0	58.4	63.8	51.9
Chos Malal	14	71.0	68.4	63.7	55.0	49.6	43.8	43.7	46.1	50.4	56.2	62.8	66.9	56.5
Bariloche	5	60.6	58.2	54.8	48.8	44.4	38.5	37.4	40.0	41.6	45.8	51.8	53.4	47.9

TABLE 24.—*Temperature data (°F.), Argentina*—Continued

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Patagonian region		Mean temperature (maximum+minimum÷2)—Continued												
Puerto Madryn [2]	8	68.8	69.4	64.0	58.6	51.2	44.9	44.5	47.0	50.8	55.0	59.8	66.3	56.7
Colonia 16 de Octubre	14	59.4	57.8	53.9	48.0	43.3	37.8	37.2	39.8	44.0	47.3	51.7	55.8	48.0
Colonia Sarmiento [2]	8	64.8	64.2	58.6	51.9	45.0	38.6	37.4	42.0	46.6	52.6	57.4	61.2	51.7
Deseado	8	61.4	58.6	56.9	50.4	44.2	39.1	39.0	41.4	45.5	50.7	55.0	56.6	49.8
Santa Cruz [2]	9	59.4	57.9	54.8	47.1	40.6	35.4	35.6	38.5	44.6	49.6	53.4	56.8	47.8
Ushuaia	6	48.6	48.4	45.5	40.0	35.5	30.6	30.8	33.6	38.6	42.6	44.8	46.4	40.4
Littoral region		Mean temperature for 24 hours [3]												
Corrientes	----	80.6	79.7	77.0	71.1	64.8	60.3	60.4	61.3	66.6	70.5	75.4	79.0	70.6
Buenos Aires	10	74.7	73.8	70.7	63.7	57.6	52.7	51.4	52.0	57.7	62.1	67.6	72.3	63.0
Buenos Aires	13	74.1	72.1	68.7	62.4	55.2	48.6	48.7	50.9	55.6	59.4	65.7	70.9	61.0
Bahia Blanca	----	74.3	71.6	67.5	60.1	53.1	47.1	46.4	48.9	53.8	59.2	66.2	71.8	60.0
Mediterranean region														
Rivadavia	----	85.6	82.4	77.5	74.5	68.0	60.6	61.7	65.8	73.2	76.6	81.5	84.4	74.3
Cordoba	----	73.9	72.3	68.5	62.1	55.8	49.6	50.4	53.4	58.6	63.3	68.4	72.1	62.4
Victorica	----	75.7	72.1	67.1	59.9	51.4	44.6	44.8	48.7	53.8	60.4	67.6	72.3	59.9
Cipolletti	----	73.8	70.5	64.8	55.9	48.2	41.5	41.2	45.3	51.1	58.3	64.4	69.8	57.1
Andean region														
La Quiaca	----	54.5	54.3	53.4	51.3	42.8	37.2	37.4	42.1	48.0	51.4	54.0	54.7	48.4
Tinogasta	10	77.0	76.8	72.9	64.0	56.7	50.2	50.9	52.2	62.2	68.2	73.8	78.8	65.3
Mendoza	----	74.5	71.6	67.5	59.5	52.0	45.5	46.4	50.0	56.1	61.9	68.0	71.4	60.4
Malargue	----	68.4	66.2	60.8	53.2	45.7	37.0	37.9	42.8	46.6	55.4	60.3	66.7	53.4
Patagonian region														
Puerto Madryn	----	68.2	66.9	63.3	57.2	50.9	45.3	45.1	47.5	51.1	55.6	60.6	64.9	56.4
Colonia Sarmiento	----	64.6	62.8	58.8	51.1	43.9	38.3	38.1	41.9	46.4	52.7	56.1	61.3	51.3
Santa Cruz	----	58.6	57.4	54.7	47.7	40.8	35.2	35.2	38.3	43.3	48.7	52.9	56.1	47.4
Ushuaia	6	49.8	48.9	46.4	40.5	36.3	33.1	33.8	35.1	39.4	42.8	44.8	46.8	41.5
Littoral region		Mean daily range in temperature [4]												
Corrientes	39	22.2	21.3	20.4	18.0	17.7	16.9	17.8	20.5	21.3	22.3	22.3	22.3	20.3
Buenos Aires	10	15.0	14.8	13.7	12.6	11.3	10.1	10.6	11.5	12.6	14.1	14.2	15.1	13.0
Buenos Aires	13	21.2	20.4	19.4	18.5	18.0	16.5	16.0	18.0	17.4	18.9	20.8	21.8	18.9
Mar del Plata	9	20.1	19.6	18.4	16.8	15.3	14.2	13.3	14.8	14.4	15.7	17.1	20.4	16.7
Bahia Blanca	42	26.7	24.3	23.6	22.7	19.5	17.2	19.1	20.7	22.2	24.3	25.2	25.8	22.6
Mediterranean region														
Rivadavia	8	31.7	30.2	28.4	25.7	29.1	29.3	30.4	36.8	34.2	30.6	33.2	32.4	31.0
Cordoba	41	26.5	25.7	23.7	24.0	25.0	25.0	26.4	28.3	27.0	25.9	25.3	25.5	25.7
Victorica	9	34.6	32.5	29.3	27.9	24.5	25.7	27.0	29.2	27.3	27.9	32.1	32.2	29.2
Cipolletti	9	32.6	33.1	33.3	30.8	26.1	24.5	27.2	30.4	30.1	27.9	32.4	30.6	29.9
Andean region														
La Quiaca	11	30.8	30.6	32.4	37.8	42.3	46.2	44.5	43.5	42.7	41.0	36.7	34.2	38.5
Tinogasta	11	33.7	34.0	34.2	36.9	38.0	38.9	39.8	41.4	42.6	39.8	36.7	35.1	37.5
Mendoza	23	30.2	27.7	26.8	25.7	24.3	22.6	24.1	25.3	25.4	26.5	29.2	30.4	26.5
Malargue	8	36.9	37.2	35.5	34.6	34.9	30.2	35.1	34.7	34.7	33.0	36.5	39.3	35.2
Patagonian region														
Puerto Madryn	8	24.6	24.7	22.9	23.3	20.7	18.2	20.0	21.3	22.3	20.9	28.1	25.0	22.7
Colonia Sarmiento	8	25.9	26.3	22.9	21.0	17.5	15.5	16.6	17.4	20.7	23.2	23.9	27.3	21.6
Santa Cruz	9	24.7	24.8	24.3	20.2	17.1	14.4	14.4	14.4	20.8	21.6	24.1	22.3	20.2
Ushuaia	6	15.7	16.9	17.0	15.0	14.6	13.9	14.1	15.8	15.5	16.7	17.3	16.6	15.7
Littoral region		Highest temperature												
Corrientes	47	112	108	104	101	96	89	93	98	102	105	106	109	112
Paso de los Libres	21	114	114	107	98	91	87	88	94	94	103	106	112	114
Ceres	24	117	115	108	104	98	89	96	101	111	111	110	118	118
Rosario	24	108	111	99	94	89	84	84	89	96	100	101	105	111
Concepcion del Uruguay	19	110	108	104	98	91	82	88	94	97	100	104	105	110
Buenos Aires	50	99	103	93	85	79	75	76	76	86	87	95	100	103
Buenos Aires	13	104	100	95	97	84	74	84	87	85	90	95	102	104
Trenque Lauquen	17	108	106	98	95	89	83	82	84	94	98	103	104	108
Azul	22	106	104	96	89	81	76	80	81	85	94	98	105	106
Mar del Plata	17	101	103	97	86	82	71	70	76	84	91	92	100	103
Bahia Blanca	50	107	108	100	90	85	76	79	85	90	96	101	105	108
Patagones	23	106	106	104	92	82	75	75	82	87	95	100	104	106
Mediterranean region														
Rivadavia	8	117	113	113	104	100	104	99	106	115	115	120	117	120
Santiago del Estero	36	115	111	108	102	103	86	96	100	108	113	113	115	115
Cordoba	49	114	111	99	94	92	89	95	98	100	105	105	109	114
Victorica	17	113	108	102	96	86	78	81	88	92	102	109	105	113
Cipolletti	17	106	106	101	89	85	79	77	85	91	92	98	105	106
Choele Choel	19	110	107	103	100	88	76	77	86	94	97	100	111	111

[2] Monthly records of temperature and pressure in Smithsonian Miscellaneous Collections, vol. 79.

[3] Obtained by reduction from monthly means and departures published in the Boletin Mensual, 1923. For the greater part the values are based on records for the period 1901–1920.

[4] Difference between mean maximum and mean minimum.

TABLE 24.—*Temperature data (°F.), Argentina*—Continued

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Andean region		Highest temperature—Continued												
La Quiaca	19	84	90	84	78	75	75	76	78	82	85	83	86	90
Humahuaca	11	92	93	91	88	84	79	80	82	88	90	93	92	93
Salta	18	98	97	96	94	99	91	96	98	100	100	99	101	101
Tucuman	48	118	111	100	95	90	97	99	98	106	108	110	106	118
Tinogasta	11	108	106	103	104	99	98	95	95	106	106	108	110	110
La Rioja	18	114	107	109	101	95	86	91	98	103	105	108	116	116
San Juan	47	111	108	105	94	94	93	92	97	100	107	105	115	115
Mendoza	31	109	105	99	91	86	86	83	92	93	97	106	108	109
Puente del Inca	7	82	82	79	76	67	47	52	55	57	65	81	78	82
San Luis	18	107	103	102	96	89	80	87	88	95	98	101	107	107
Malargue	8	95	96	98	87	85	73	77	78	84	88	90	95	98
Chos Malal	22	105	99	96	91	84	75	77	81	91	88	100	100	105
Bariloche	13	87	92	85	74	73	59	64	66	72	77	90	99	99
Patagonian region														
Puerto Madryn	8	102	101	99	95	80	71	73	84	84	89	94	102	102
Colonia 16 de Octubre	22	98	95	88	82	72	65	69	65	74	79	91	95	98
Colonia Sarmiento	13	99	96	93	83	71	64	68	67	76	86	92	99	99
Deseado	8	102	98	89	93	72	61	62	67	71	83	90	90	102
Santa Cruz	17	93	93	90	82	68	59	58	67	74	81	90	91	93
Ushuaia	7	81	79	72	65	59	57	54	59	61	70	73	80	81
Littoral region		Lowest temperature												
Corrientes	47	54	50	51	46	33	31	34	34	35	39	49	51	31
Paso de los Libres	21	49	50	47	40	30	28	28	28	32	38	45	48	28
Ceres	24	44	38	39	35	21	19	20	19	24	28	39	42	19
Rosario	24	44	39	35	33	24	18	21	21	23	27	31	40	18
Concepcion del Uruguay	19	49	48	39	37	29	25	25	28	30	32	39	43	25
Buenos Aires	50	47	46	44	35	33	30	28	32	30	37	40	46	28
Buenos Aires	13	43	40	38	29	25	23	22	28	32	29	36	39	22
Trenque Lauquen	17	38	33	29	26	17	13	14	20	23	24	34	39	13
Azul	22	35	36	32	25	19	18	16	21	25	24	29	34	16
Mar del Plata	17	39	39	40	33	27	22	26	28	28	31	34	38	22
Bahia Blanca	50	42	36	39	30	28	18	18	18	23	25	30	38	18
Patagones	23	37	41	37	34	25	23	24	26	28	32	37	39	23
Mediterranean region														
Rivadavia	8	54	55	51	39	28	25	23	28	34	43	48	50	23
Santiago del Estero	36	51	54	50	37	30	25	24	28	30	43	39	44	24
Cordoba	49	42	38	33	31	20	17	13	19	21	30	36	39	13
Victorica	17	36	35	30	24	16	12	4	16	19	24	32	34	4
Cipolletti	17	38	35	30	19	14	10	9	13	19	24	31	37	9
Choele Choel	19	37	32	35	24	13	14	11	18	20	25	34	34	11
Andean region														
La Quiaca	19	26	30	23	14	8	0	0	6	9	9	22	27	0
Humahuaca	11	32	36	34	20	19	12	12	11	21	22	30	32	11
Salta	18	42	44	40	29	24	18	15	22	22	30	38	44	15
Tucuman	48	52	50	46	36	31	26	26	27	31	36	44	44	26
Tinogasta	11	43	42	35	28	16	15	14	16	20	20	36	35	14
La Rioja	16	53	55	50	38	28	27	23	28	30	39	46	49	23
San Juan	47	42	44	37	30	28	17	18	22	28	30	36	36	17
Mendoza	31	41	41	29	30	23	15	16	23	25	32	36	36	15
Puente del Inca	7	30	26	23	8	7	−2	−1	0	7	9	18	16	−2
San Luis	18	45	47	40	32	24	14	18	23	24	33	38	45	14
Malargue	8	32	34	25	18	9	−2	−10	−4	17	19	25	29	−10
Chos Malal	22	40	36	27	21	17	15	12	18	21	27	34	32	12
Bariloche	13	32	33	25	23	20	12	11	10	20	24	25	32	10
Patagonian region														
Puerto Madryn	8	40	44	36	32	25	20	11	20	19	28	32	36	11
Colonia 16 de Octubre	22	25	24	19	17	10	−4	4	4	11	20	22	24	−4
Colonia Sar miento[4]	13	34	34	27	18	11	8	−27	3	14	19	29	32	−27
Deseado	8	38	36	32	30	23	8	1	17	22	19	30	32	1
Santa Cruz	17	32	30	28	23	12	5	9	6	21	20	26	33	5
Ushuaia	7	28	28	27	21	−4	−1	−3	9	18	24	26	27	−4

[4] In the month of June, 1907, the minimum thermometers at the stations of Colonia Sarmiento and Buen Pasto recorded a temperature of −33° C., and at other points in the same territory (Chubut) temperatures of −29° and −28° C. Walter G. Davis. Clima de la República Argentina, p. 10. (1909.)

TABLE 24.—*Temperature data (°F.), Argentina*—Continued

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Patagonian region—Continued		Mean number of days with maximum temperature 95° F. or above												
Corrientes	4	22.0	9.8	6.5	1.5	0.0	0.0	0.0	0.5	1.2	2.2	5.8	14.2	63.7
Buenos Aires	13	0.6	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.3
Buenos Aires	9	2.8	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.4	5.0
Bahia Blanca	28	6.5	5.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	3.4	16.6
Santiago del Estero	4	15.0	13.0	3.8	0.2	0.0	0.0	0.5	0.5	0.8	5.0	9.5	11.8	60.1
Cordoba	28	3.3	2.2	0.8	0.0	0.0	0.0	0.0	0.1	0.5	0.5	0.6	1.7	9.7
Cipolletti	4	10.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	5.2	22.0
Tucuman	40	2.6	2.6	0.9	0.0	0.0	0.0	0.1	0.0	0.8	0.6	6.1	5.4	19.3
Mendoza	34	2.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	2.6	4.4	10.3
Puerto Madryn	12	1.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	3.0
Littoral region		Mean number of days with minimum temperature 32° F. or below												
Corrientes	47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paso de los Libres	8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.4	0.1	0.0	0.0	0.0	2.3
Ceres	8	0.0	0.0	0.0	0.0	2.2	9.0	9.0	4.6	0.5	0.0	0.0	0.0	25.3
Rosario	8	0.0	0.0	0.0	0.0	0.1	1.5	2.1	0.4	0.0	0.0	0.0	0.0	4.1
Concepcion del Uruguay	8	0.0	0.0	0.0	0.0	0.5	4.0	3.8	1.6	0.0	0.0	0.0	0.0	9.9
Buenos Aires	13	0.0	0.0	0.0	0.0	0.1	0.9	0.5	0.2	0.2	0.0	0.0	0.0	1.9
Buenos Aires	13	0.0	0.0	0.0	0.1	1.2	4.9	5.2	2.3	0.1	0.2	0.0	0.0	14.0
Azul	8	0.0	0.0	0.0	0.9	5.0	12.0	12.8	8.9	3.8	0.8	0.2	0.0	44.4
Bahia Blanca	36	0.0	0.0	0.0	0.4	0.9	5.0	5.2	4.7	1.6	0.2	0.0	0.0	18.0
Patagones	8	0.0	0.0	0.0	0.0	1.1	3.6	6.6	2.6	0.3	0.0	0.0	0.0	14.2
Mediterranean region														
Rivadavia	8	0.0	0.0	0.0	0.0	0.8	1.6	3.0	1.2	0.0	0.0	0.0	0.0	6.6
Santiago del Estero	8	0.0	0.0	0.0	0.0	0.5	3.2	4.1	0.2	0.0	0.0	0.0	0.0	8.0
Cordoba	36	0.0	0.0	0.0	0.1	2.7	9.7	7.8	4.5	1.5	0.0	0.0	0.0	26.3
Victorica	8	0.0	0.0	0.0	1.0	6.2	17.2	16.6	13.1	5.4	0.8	0.0	0.0	64.6
Cipolletti	8	0.0	0.0	0.0	3.4	12.1	20.2	21.6	14.0	8.5	1.0	0.0	0.0	80.8
Andean region														
La Quiaca	8	0.0	0.1	0.0	11.6	28.4	28.9	30.6	30.0	24.4	12.2	3.0	0.1	169.3
Salta	8	0.0	0.0	0.0	0.0	2.2	9.6	12.1	5.4	1.1	0.0	0.0	0.0	30.4
Tucuman	40	0.0	0.0	0.0	0.0	0.0	3.4	2.4	3.1	0.1	0.0	0.0	0.0	9.0
San Juan	8	0.0	0.0	0.0	0.0	2.1	9.5	10.1	4.0	0.1	0.1	0.0	0.0	25.9
Mendoza	34	0.0	0.0	0.0	0.3	1.9	8.4	8.8	4.1	0.2	0.0	0.0	0.0	23.7
Malargue	8	0.1	0.0	0.8	7.9	22.5	27.8	29.0	26.6	20.9	9.8	3.0	1.0	149.4
Chos Malal	8	0.0	0.0	0.2	4.4	10.0	15.1	17.7	14.4	9.0	1.0	0.0	0.2	72.0
Bariloche	8	0.0	0.0	0.0	2.3	5.9	11.9	15.1	13.6	10.9	3.8	0.9	0.0	64.4
Patagonian region														
Puerto Madryn	8	0.0	0.0	0.0	0.1	2.4	9.8	10.8	7.9	3.2	1.0	0.1	0.0	35.3
Colonia 16 de Octubre	8	0.9	1.9	2.1	9.8	14.8	19.4	19.9	20.4	17.9	9.9	4.2	1.8	123.0
Colonia Sarmiento	8	0.0	0.0	0.2	3.5	9.0	15.6	16.9	11.2	7.0	1.6	0.2	0.0	65.2
Santa Cruz	8	0.0	0.0	0.9	4.4	9.2	18.5	19.2	18.1	8.9	3.0	0.4	0.0	82.6

Relative humidity.—Table 25 sets forth average conditions of humidity for the day and also for the approximate hours of maximum (7 a. m.) and minimum (2 p. m.). We may take Buenos Aires[9] to represent the most humid and Cipolletti[10] the least humid region. At the former the annual means for 24 hours, 7 a. m. and 2 p. m., are, respectively, 77, 86, and 69 per cent, while at the latter the corresponding values are 56, 65, and 37 per cent. At Buenos Aires the means range from 90 to 92 per cent at 7 a. m. during May–August; the other extreme condition is that shown at Cipolletti, 28 to 29 per cent at 2 p. m. in November–January.

[9] Reference is made to the results of observations at locations in the city proper, Colegio Nacional and Calle Independencia, and not to those at the suburban station Chacarita.

[10] Table 25 shows somewhat lower means for La Quiaca, but data are not available for hours approximate to the time of occurrence of maximum and minimum.

TABLE 25.—*Relative humidity data, Argentina*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean relative humidity reduced to 24-hour values														
Corrientes	8	63	68	70	74	78	77	75	67	68	67	62	66	70
Rosario	8	64	68	71	77	78	79	78	71	70	69	66	66	71
Concepcion del Uruguay	8	66	68	72	79	80	81	80	75	76	73	68	78	74
Buenos Aires [1]	10	69	72	76	78	84	87	84	80	77	73	70	71	77
Buenos Aires [1]	7	68	75	76	81	82	84	83	77	78	76	72	71	77
Trenque Lauquen	8	63	67	71	75	76	77	76	68	68	73	68	65	71
Mar del Plata	8	72	76	76	77	79	81	79	76	78	78	75	71	76
Bahia Blanca	8	49	57	62	67	71	73	72	62	64	68	58	50	63
Santiago del Estero	8	63	66	69	71	72	69	67	56	55	61	59	64	64
Cordoba	8	63	69	72	72	70	65	63	55	55	63	60	63	64
Victorica	8	50	56	60	63	67	69	67	56	53	58	50	46	58
Cipolletti	8	46	52	58	62	65	70	69	59	52	55	47	41	56
La Quiaca	8	64	61	62	52	41	40	36	33	36	47	53	59	49
Salta	8	75	78	79	80	77	72	67	59	58	65	65	70	70
Mendoza	8	59	63	65	66	55	63	59	50	47	53	51	55	58
Bariloche	8	62	64	70	75	78	80	80	78	70	67	66	62	71
Puerto Madryn	8	52	56	57	57	59	67	66	59	60	63	54	51	58
Colonia 16 de Octubre	8	53	53	63	68	73	76	74	70	64	60	56	54	64
Colonia Sarmiento	8	48	49	56	58	64	70	69	64	56	54	48	48	57
Santa Cruz	8	50	52	56	60	66	72	71	67	60	58	52	52	60
Ushuaia [2]	4	69	69	71	75	80	85	88	84	77	71	70	70	76
Mean relative humidity 7 a. m.														
Corrientes	11	78	77	80	81	81	82	83	79	78	76	77	76	79
Buenos Aires	45	81	83	87	88	90	91	92	90	86	83	79	79	86
Buenos Aires	5	75	77	82	88	89	91	92	89	88	79	75	67	83
Trenque Lauquen [3]	4	62	70	74	81	83	84	84	76	72	70	62	65	74
Bahia Blanca	28	63	70	77	80	82	86	79	80	76	68	63	58	73
Santiago del Estero	9	72	74	80	82	82	80	76	70	66	69	67	67	74
Cordoba	28	75	78	86	84	82	83	80	74	70	70	70	72	77
Cipolletti [3]	4	48	59	67	74	80	83	84	77	62	56	47	44	65
Salta	12	84	84	87	84	84	81	76	72	69	70	74	78	79
Mendoza	34	59	63	68	73	74	73	72	67	55	51	52	54	63
Colonia 16 de Octubre [3]	4	56	64	74	74	79	83	80	80	72	62	56	54	70
Santa Cruz [3]	4	54	59	64	70	75	77	75	73	68	58	54	52	65
Ushuaia	4	72	76	79	80	82	87	89	85	78	75	74	71	79
Mean relative humidity 2 p. m.														
Corrientes	11	63	61	66	68	71	73	73	65	64	62	63	62	66
Buenos Aires	45	61	63	69	71	74	78	79	74	68	65	60	62	69
Buenos Aires	5	51	49	54	60	62	71	71	66	66	56	53	42	58
Trenque Lauquen	4	40	42	46	56	57	60	56	46	50	48	44	44	49
Bahia Blanca	28	41	41	46	50	56	64	56	54	45	40	38	35	47
Santiago del Estero	9	47	49	58	68	55	56	48	39	41	42	43	42	48
Cordoba	28	47	48	54	50	47	46	42	37	38	42	45	47	45
Cipolletti	4	28	33	38	39	45	50	49	40	32	32	29	28	37
Salta	12	64	67	71	67	61	55	51	44	46	46	49	55	56
Mendoza	34	42	44	47	50	52	50	48	42	33	34	34	37	43
Colonia 16 de Octubre	4	34	39	47	52	62	67	61	59	46	36	40	36	48
Santa Cruz	4	40	42	42	49	53	67	62	53	47	42	40	42	48
Ushuaia	4	61	58	60	67	76	83	85	81	73	64	62	63	70

[1] See note under Table 24.
[2] Observations at 7 a. m., 2 p. m., and 9 p. m.
[3] Observations at 8 a. m.

Cloudiness and sunshine.—Tables 26 and 27 indicate a rather uniform distribution of these meteorological elements over most of Argentina. The excessive cloudiness at Ushuaia in summer (7.0) contrasts strongly with the low values for cloudiness at La Quiaca in midwinter (2.0). Abundant sunshine, daily duration over 7.5 hours, is received at all stations from November to February, inclusive.

TABLE 26.—*Mean cloudiness* [1] *(scale 0–10), Argentina*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Corrientes	----	3.7	4.4	4.2	4.4	4.9	4.8	4.6	5.7	4.5	4.8	4.7	4.7	4.5
Rosario	----	4.5	4.2	4.4	4.4	4.1	5.3	4.8	4.4	4.4	4.8	4.3	4.3	4.5
Buenos Aires	----	4.0	4.2	4.0	4.0	5.1	5.8	5.0	4.6	4.7	5.3	4.5	4.1	4.6
Bahia Blanca	----	3.7	3.7	3.7	4.1	4.9	5.8	5.1	4.8	4.5	4.5	4.2	3.8	4.4
Cordoba	----	5.1	5.2	5.0	5.5	6.0	6.4	5.3	4.9	4.9	5.1	5.2	5.4	5.3
Victorica	8	4.5	4.6	4.3	4.6	5.0	5.6	5.3	4.8	5.0	5.6	4.8	4.5	4.9
Cipolletti	8	3.2	3.1	3.9	4.1	4.9	5.4	5.1	5.0	4.6	4.8	4.2	3.4	4.3
La Quiaca	----	5.8	5.4	4.5	2.9	2.2	1.8	2.3	5.0	2.9	3.7	4.3	5.4	3.8
Tucuman	----	6.4	6.7	6.6	6.5	5.5	5.7	4.3	2.8	4.7	5.9	6.4	6.2	5.8
Mendoza	----	3.4	4.0	3.1	3.7	4.0	4.1	3.7	4.6	3.1	3.3	3.0	3.0	3.5
Chos Malal	8	3.2	2.9	3.5	3.6	4.8	5.0	4.9	3.2	4.4	4.2	4.2	3.6	4.1
Puerto Madryn	8	4.3	4.1	4.5	4.6	5.3	5.6	5.5	4.7	5.3	5.6	5.7	5.3	5.1
Colonia 16 de Octubre	----	4.6	4.4	5.0	5.7	6.8	6.3	6.6	5.6	5.6	5.0	5.4	5.1	5.5
Colonia Sarmiento	8	6.6	6.2	6.7	6.5	6.5	6.3	6.3	5.8	6.3	6.5	7.0	6.7	6.5
Santa Cruz	----	5.5	5.3	4.9	5.2	5.2	5.0	5.1	6.3	4.0	4.7	4.7	5.8	5.0
Ushuaia	----	7.3	6.8	6.4	5.3	6.4	5.5	5.7	4.9	5.9	6.6	6.5	7.1	6.3

[1] This table is taken in large part from the work by Davis issued in 1909; data as to length of record are not available for all stations.

TABLE 27.—*Sunshine data, Argentina*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Mean daily duration of sunshine, in hours														
Rosario	12	9.2	8.9	8.1	7.2	5.6	4.4	4.7	5.8	7.1	7.8	8.7	8.9	7.2
Buenos Aires	21	9.2	8.5	7.5	6.8	4.9	3.5	3.8	5.2	6.0	6.8	8.1	8.5	6.6
Cordoba	21	9.0	8.5	7.6	6.9	6.3	5.2	5.8	7.2	7.7	8.0	8.8	8.7	7.5
Cipolletti	4	11.1	9.8	7.8	6.5	4.9	3.8	4.6	5.7	6.3	8.7	8.7	10.7	7.4
Mendoza	4	8.9	8.6	7.3	7.3	6.8	5.6	6.6	8.0	8.1	8.6	10.6	10.0	8.0
Santa Cruz	4	8.0	7.6	5.9	4.6	3.5	3.1	3.8	4.9	5.4	6.8	7.5	7.8	5.7
Mean percentage of possible sunshine														
Rosario	12	66	68	66	65	55	44	47	54	60	61	63	63	59
Buenos Aires	21	64	64	62	63	51	39	40	45	53	54	61	59	55
Cordoba	21	66	65	62	61	61	52	57	66	66	63	65	62	53

Precipitation.—Since revision has not made material change in the means, it will be permissible to describe the distribution of amount of annual precipitation from the chart published by Davis (1914).

North of latitude 30° the annual isohyets have a general north-south direction and show a decided increase in precipitation from west to east. (Heavy summer rains over a narrow region from Jujuy to Tucuman interrupt the continuity of this change.) The stages in transition from aridness to abundant supply of rainfall are shown by the values (in inches) for the following stations: Near latitude 27° 30′; Tinogasta, 4; Catamarca, 13; Santiago del Estero, 20; Alhuampa, 32; Corrientes, 48; and Posadas, 59.

The region between latitudes 30° and 40° shows a similar increase in precipitation, with advance eastward, but the limiting values are far less widely separated than those of the northern belt. On a cross section near latitude 38° the following means (in inches) are found: Las Lajas, 8; Cipolletti, 7; Choele Choel, 9; Bahia Blanca, 21; Tres Arroyos, 26; and Mar del Plata, 30.

Bariloche and Colonia Suiza, with yearly means of 39 and 55 inches, respectively, mark the area of heaviest precipitation along the western border. Elsewhere south of latitude 40° the arid western belt has widened to the Atlantic coast and the highest values for mean yearly rainfall are 16 inches at Colonia 16 de Octubre and 19 inches at Ushuaia.

In the littoral region the annual march of precipitation generally shows the double wave: Maxima in March–April and October–December and minima in June–August and January–February. As a rule the maxima are of about equal importance; the chief minimum of July–August shows strong contrast to the maxima, but the secondary in January–February is not specially marked, indeed, at many stations it is little more than nominal.

West of the littoral area and north of latitude 35° the march of precipitation presents a single maximum in summer (December to February) and a single minimum from June to August. In most of this territory the wet and dry seasons are unusually well defined. From Oran to Tucuman the average rainfall for the wettest month is over 6 inches, while that for the driest month is less than 0.25 inch. Along the northwestern border, from La Quiaca to Tinogasta, summer rainfall is light to moderate, while a large part of the cooler season, the months of June, July, August, and September, is rainless.

From Chos Malal and Choele Choel to the latitude of Deseado there is as a rule a more or less marked winter maximum of precipitation (in May or June) with summer minimum in the northern and spring minimum in the

southern part of this semiarid region. In the extreme south the light precipitation is fairly evenly distributed over the year.

Even in the well-watered northeastern area precipitation has only moderate frequency, as is shown by the maximum mean annual number of rainy days at Paso de los Libres and Buenos Aires, 96 and 93, respectively. At most stations in the Andean and Patagonian regions rainfall is recorded on fewer than 40 days in the year and at two stations on fewer than 15 days (Tinogasta, 14; San Juan, 11). South of Deseado precipitation becomes more frequent; at Ushuaia, on the southern coast of Tierra del Fuego, the mean annual number of rainy days is 115.

Data on frequency of snowfall are very meager. The following paragraph by Davis (1901), the best general statement available, is quoted to supplement Table 28.

In the southern extremity of the continent snow frequently falls and more often in the adjacent islands. In Staten Island snow has fallen in every month of the year, generally in small quantities and quickly disappearing. In the territories of Santa Cruz, Chubut, Rio Negro, and Neuquen [11] there is snow every winter, but it rarely reaches the Province of Buenos Aires, and, with the exception of the region near the foothills of the cordilleras, the ground is seldom covered more than two or three successive days. In the sierras of Cordoba and San Luis there are occasional snowfalls every winter—from April to October—but they rarely extend to the level of the pampas. In the city of Mendoza slight snowfalls occur nearly every winter and much more frequently in the neighboring low sierras, especially in the months of July and August.

TABLE 28.—*Precipitation data, Argentina*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Formosa		Mean precipitation (in inches)[1]												
Formosa		4.09	5.12	5.63	5.75	3.70	2.76	1.85	1.38	2.91	6.42	7.28	6.50	53.39
Kilometer 182	7	3.94	4.20	5.06	4.79	2.56	2.53	1.05	0.63	1.88	5.49	3.37	2.76	38.26
Misiones														
Posadas [2]		4.61	5.24	5.35	6.06	4.96	4.92	4.53	3.27	3.58	5.91	5.24	5.04	58.71
Corrientes														
Corrientes [2]		4.21	4.33	6.02	5.59	4.02	1.77	2.05	1.57	2.72	5.04	5.24	5.87	48.43
Goya [2]		4.06	4.49	6.61	6.06	2.95	1.73	2.01	1.42	2.68	4.72	4.61	4.92	46.26
Paso de los Libres		3.94	4.84	5.79	6.73	5.59	4.06	3.27	3.19	4.88	5.98	4.88	5.12	58.27
Santa Fe														
Ceres		4.61	4.45	4.92	4.02	1.57	0.51	0.83	0.59	1.73	2.83	4.09	4.45	34.60
Rosario		2.99	2.76	3.46	4.33	1.77	1.22	1.42	1.38	2.20	3.82	4.21	3.98	33.54
Santa Fe		3.78	3.78	4.17	5.12	2.24	1.34	1.46	1.10	2.05	3.35	4.41	4.80	37.60
Entre Rios														
Concepcion del Uruguay		3.43	2.68	4.92	5.16	2.64	2.09	2.48	2.32	2.83	3.19	3.19	3.66	38.59
Concordia [2]		2.99	3.35	4.76	5.65	2.99	2.20	2.28	1.73	2.87	3.03	3.46	4.21	39.50
Buenos Aires														
Azul		2.76	3.19	3.62	3.19	2.20	1.54	1.65	1.42	2.56	3.50	3.07	3.15	31.85
Bahia Blanca [2]		2.20	2.24	2.24	3.46	1.14	0.63	0.91	0.71	1.65	2.48	1.81	2.05	21.52
Buenos Aires [2]		3.11	2.60	3.94	4.72	2.83	2.01	2.16	2.24	2.87	3.35	3.94	4.09	37.86
Dolores	11	2.52	2.99	3.98	2.60	1.93	2.64	1.85	2.13	2.60	2.68	2.32	2.60	30.84
Junin		2.83	2.68	3.78	3.27	1.81	0.91	1.22	1.30	1.97	3.27	4.13	2.91	30.08
Mar del Plata [2]		2.13	2.91	3.15	3.07	1.93	2.40	2.16	1.81	2.60	2.40	2.52	2.72	29.80
Patagones		1.14	0.87	0.83	1.61	1.10	0.91	0.98	0.39	0.83	1.22	0.90	1.26	12.04
Trenque Lauquen		3.31	3.42	3.62	3.50	1.65	0.94	0.94	0.98	1.93	2.91	3.11	3.90	30.21
Tres Arroyos		2.56	2.91	2.68	2.87	1.26	1.38	1.57	1.30	2.01	2.48	2.28	2.83	26.13
Santiago del Estero														
Alhuampa	8	4.09	4.55	3.21	3.18	1.18	0.17	0.73	0.35	1.76	2.35	4.65	5.79	32.01
Santiago del Estero		3.42	2.80	2.99	1.26	0.55	0.32	0.20	0.24	0.51	1.46	2.44	4.21	20.40
Cordoba														
Cordoba [2]		4.17	4.32	3.50	1.68	0.99	0.28	0.33	0.51	0.90	2.38	4.02	4.65	27.73
Rio Cuarto		4.06	3.42	3.86	2.36	1.18	0.32	0.47	0.79	1.10	3.39	4.21	4.88	30.04
San Luis														
San Luis		4.29	3.78	2.36	1.50	0.75	0.24	0.43	0.43	0.71	1.38	2.72	3.70	22.29

[11] The northern limit of this combined territory is marked rather accurately by the stations of Chos Malal and Choele Choel.

TABLE 28.—*Precipitation data, Argentina*—Continued

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
La Pampa		Mean precipitation (in inches)—Continued												
General Acha [3]		1.93	2.40	2.52	2.64	0.98	0.35	0.87	0.47	1.38	1.81	1.89	1.81	19.05
Victorica		2.95	2.99	2.95	1.61	0.91	0.43	0.35	0.51	1.18	2.56	2.01	2.20	20.65
Jujuy														
Humahuaca	11	1.69	1.22	0.87	0.12	0.00	0.00	0.00	0.00	0.00	0.47	0.83	0.91	6.11
Jujuy		6.65	5.12	5.63	1.26	0.51	0.16	0.16	0.12	0.35	1.54	2.56	5.20	29.26
La Quiaca		3.27	2.36	2.01	0.28	0.00	0.00	0.04	0.00	0.00	0.20	1.06	2.13	11.35
Salta														
Oran		5.71	5.67	4.09	2.27	1.18	0.51	0.35	0.35	1.14	2.52	3.90	5.08	32.74
Rivadavia		3.90	4.02	2.95	1.34	0.43	0.12	0.08	0.24	0.75	1.54	2.20	2.99	20.56
Salta [2]		6.50	6.22	4.02	1.26	0.39	0.12	0.04	0.20	0.35	1.22	2.44	5.20	27.96
Tucuman														
Tucuman [2]		6.42	6.93	5.59	3.09	1.22	0.55	0.32	0.51	0.59	2.36	4.13	6.06	37.77
Catamarca														
Catamarca [2]		2.64	2.44	2.20	0.59	0.47	0.20	0.08	0.32	0.35	0.87	1.18	1.93	13.27
Tinogasta	10	1.54	1.87	0.83	0.16	0.12	0.00	0.00	0.00	0.00	0.00	0.32	0.51	4.35
La Rioja														
Chepes	6	1.77	1.50	1.34	0.71	0.16	0.16	0.12	0.39	0.51	0.51	1.42	1.06	9.65
La Rioja		2.68	2.52	2.28	0.79	0.47	0.16	0.12	0.16	0.16	0.79	1.38	1.81	13.32
San Juan														
Jachal	10	1.30	0.98	1.38	0.08	0.24	0.08	0.16	0.16	0.12	0.43	0.39	0.67	5.99
San Juan [2]		0.79	0.71	0.43	0.08	0.04	0.04	0.28	0.12	0.12	0.24	0.24	0.39	3.48
Mendoza														
Malargue	8	1.44	0.72	2.35	0.80	1.34	0.50	0.43	0.27	0.48	1.29	0.51	0.64	10.77
Mendoza [3]		0.87	1.18	1.10	0.47	0.39	0.35	0.24	0.32	0.51	0.75	0.71	0.75	7.64
Puente del Inca	7	0.00	0.16	0.00	0.16	0.94	1.10	0.59	0.51	0.12	0.28	0.04	0.24	4.14
San Rafael	5	1.34	1.50	1.46	0.32	0.04	0.04	0.00	0.24	0.51	0.51	1.02	1.18	8.16
Neuquen														
Chos Malal		0.32	0.28	0.24	0.55	1.97	1.97	0.91	1.18	0.55	0.35	0.47	0.32	9.11
Junin de los Andes [3]	8	0.80	0.43	1.91	1.04	2.47	2.98	2.60	2.17	0.95	0.86	1.18	0.59	17.98
Las Lajas		0.28	0.35	0.35	0.55	1.18	1.46	1.14	0.94	0.59	0.35	0.32	0.32	7.83
Rio Negro														
Bariloche		1.42	0.83	2.20	3.54	8.23	5.67	4.92	5.00	2.72	1.46	1.85	1.18	39.02
Choele Choel		0.71	0.71	0.98	0.94	1.10	0.63	0.47	0.28	0.83	0.91	0.47	0.55	8.58
Cipolletti [3]		0.43	0.43	0.75	0.43	0.55	0.94	0.51	0.43	0.39	0.83	0.55	0.47	6.71
Colonia Suiza	5	1.11	1.18	4.52	4.98	10.16	7.12	7.14	7.09	3.48	1.91	2.88	3.09	54.66
Maquinchao	8	0.66	0.50	1.07	0.26	0.95	0.71	0.53	0.61	0.55	1.02	0.63	0.69	8.18
San Antonio	10	0.59	0.28	0.67	1.14	1.10	0.67	0.75	0.24	0.71	0.43	0.20	0.20	6.98
Valcheta		0.30	0.43	0.20	1.16	0.59	0.61	0.71	0.41	0.69	0.82	0.52	0.39	6.83
Chubut														
Camarones		0.55	0.47	0.51	0.51	0.63	0.83	0.55	0.32	0.28	0.43	0.39	0.32	5.79
Colonia San Martin	5	0.28	0.43	0.43	1.02	1.61	1.50	1.57	0.24	0.35	0.35	0.20	0.20	8.18
Colonia Sarmiento [3]		0.16	0.32	0.39	0.47	0.79	0.51	0.83	0.35	0.47	0.24	0.24	0.16	4.93
Colonia 16 de Octubre [3]		0.47	0.47	0.83	2.05	3.27	2.76	1.57	2.01	0.83	0.43	0.51	0.55	15.75
Puerto Madryn [3]		0.50	.559	0.47	0.63	0.67	0.63	0.47	0.26	0.35	0.55	0.32	0.43	5.92
Santa Cruz														
Deseado	8	0.59	0.51	0.28	0.71	1.61	0.59	1.30	0.51	0.12	0.32	0.16	0.47	7.17
Gallegos	13	10.6	0.67	1.18	0.83	1.30	1.42	0.79	0.63	0.39	0.75	0.87	1.77	11.66
La Madrugada	8	0.91	0.39	0.50	0.36	1.60	1.00	0.47	0.47	0.43	0.89	0.53	0.55	8.10
Santa Cruz [3]		0.59	0.28	0.35	0.63	0.43	0.51	0.39	0.55	0.28	0.28	0.39	0.67	5.35
Tierra del Fuego														
Ushuaia		1.77	1.93	1.69	1.81	1.57	1.54	1.26	0.91	1.18	1.50	1.89	1.80	18.85
		Maximum precipitation in 24 hours (in inches)												
Formosa	14	4.49	7.20	5.02	5.35	5.00	7.52	1.97	1.89	2.74	4.61	4.57	8.78	8.78
Corrientes	25	4.45	6.00	7.08	6.61	4.16	3.60	2.83	2.24	5.20	5.80	4.42	5.73	7.08
Goya	25	4.29	4.65	6.42	6.46	4.25	3.11	4.25	2.80	2.91	5.61	5.43	4.72	6.46
Rosario [3]	11	4.00	4.67	*	3.41	4.42	2.66	1.54	2.48	3.31	2.74	4.01	3.89	10.00
Concordia	14	3.57	2.68	6.52	5.00	4.91	2.09	3.36	3.10	3.61	3.05	1.96	3.11	6.52
Buenos Aires	40	3.74	3.42	4.92	3.19	4.02	2.36	2.28	1.42	3.42	4.61	1.81	3.54	4.92
Bahia Blanca	29	2.74	2.30	3.94	3.18	2.48	4.64	3.97	2.36	4.55	2.67	2.65	2.13	4.64
Santiago del Estero	18	2.52	2.70	4.43	1.25	1.94	1.01	0.52	0.37	1.63	2.10	2.65	1.62	4.43
Cordoba	28	4.52	5.65	3.32	2.46	3.58	0.57	0.69	1.45	2.18	2.68	2.76	3.67	5.65
Salta	25	2.39	1.80	3.98	0.96	0.13	0.08	0.00	0.87	0.63	0.59	2.99	2.09	3.98
Tucuman	28	4.57	4.00	6.20	1.87	3.04	0.80	0.85	1.05	1.31	2.72	3.31	5.51	6.20
Catamarca	10	1.84	2.62	1.15	1.44	0.75	0.20	0.18	0.59	0.72	0.91	1.57	1.10	2.62
La Rioja	18	1.44	1.97	3.55	0.79	0.14	0.40	0.72	0.30	0.22	0.98	1.38	2.01	3.55
San Juan	26	1.46	0.53	1.18	0.61	0.36	0.30	0.06	0.32	0.12	0.79	0.98	0.75	1.46
Mendoza	31	1.91	1.94	0.79	0.89	0.32	0.98	0.24	0.45	0.24	1.54	0.98	0.87	1.94
Rawson	14	1.01	2.76	2.85	1.44	0.83	1.28	0.58	0.83	1.24	0.71	1.59	2.33	2.85

[1] For those stations with length of record blank the means are derived from monthly totals and departures given in the Boletin Mensual for the year 1923. In nearly all cases the values are based on the period from 1901 to 1920, inclusive.

[2] Monthly records in Smithsonian Miscellaneous Collections, vol. 79.

[3] 10 inches on Mar. 26, 1880. In Clima de la Republica Argentina (1902) Davis gives 12.87 inches for Parana (near Santa Fe) in the month of June, but, unfortunately, omits the year of occurrence.

* 10.00 inches.

TABLE 28.—*Precipitation data, Argentina*—Continued

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
		Mean number of days with precipitation [4]												
Formosa	19	6	6	6	6	4	4	3	3	5	6	6	6	61
Posadas	7	6	7	6	7	6	6	6	6	7	7	7	7	78
Corrientes	39	5	5	5	5	4	4	3	3	4	6	6	6	56
Goya	37	5	3	4	4	3	2	2	2	3	4	4	4	40
Paso de los Libres	13	6	6	7	9	8	8	8	8	9	9	9	9	96
Ceres	16	6	6	6	6	4	3	3	3	4	6	8	8	63
Rosario	16	7	6	7	6	6	4	4	4	5	7	7	8	71
Santa Fe	18	6	6	8	6	5	4	4	4	6	7	7	8	71
Concepcion del Uruguay	11	6	5	6	6	5	5	5	5	6	6	6	8	69
Concordia	26	5	6	6	6	4	5	5	5	6	6	5	6	65
Azul	14	6	6	7	5	5	5	4	4	6	7	8	7	70
Bahia Blanca	42	5	5	6	5	4	3	4	4	5	6	6	5	58
Buenos Aires	53	7	6	7	8	7	7	8	9	8	9	9	8	93
Dolores	11	6	5	6	4	4	5	5	5	5	6	6	6	63
Junin	12	4	4	5	3	3	3	2	3	4	6	6	6	49
Mar del Plata	9	5	7	6	6	6	6	5	5	7	6	7	7	72
Patagones	15	3	3	3	5	5	5	4	4	4	4	3	3	46
Trenque Lauquen	9	6	6	6	4	4	3	3	3	5	6	8	7	61
Tres Arroyos	11	6	6	6	7	4	3	4	3	4	5	5	7	60
Santiago del Estero	28	6	6	6	4	2	2	1	1	2	4	5	5	44
Cordoba	41	10	9	9	5	3	2	2	2	4	8	10	6	70
Rio Cuarto	14	7	7	8	5	4	3	3	4	4	7	10	9	71
San Luis	8	9	7	5	4	2	2	1	2	3	4	7	8	54
General Acha	13	4	4	4	4	2	2	2	2	4	4	4	4	40
Victorica	9	6	6	6	5	3	2	2	3	5	7	6	6	57
Humahuaca	11	5	4	4	1	0	0	0	0	0	1	3	2	20
Jujuy	14	12	11	12	6	3	2	1	1	2	6	9	12	77
La Quiaca	11	12	9	7	2	0	0	0	0	1	1	5	9	46
Rivadavia	8	6	5	5	4	1	1	1	1	2	5	3	5	39
Salta	10	10	10	9	4	2	1	1	1	2	4	7	10	61
Tucuman	40	10	11	11	7	5	4	2	2	3	7	8	11	81
Catamarca	10	6	5	5	4	3	1	1	1	1	4	5	6	42
Tinogasta	10	4	3	2	1	1	0	0	0	0	0	1	2	14
La Rioja	10	4	4	4	2	1	1	1	1	0	2	4	5	29
Jachal	10	2	3	4	1	1	1	1	2	1	1	1	2	21
San Juan	39	1	2	1	1	0	0	1	0	1	1	1	2	11
Malargue	8	5	5	4	2	2	2	2	1	2	5	2	3	35
Mendoza	23	4	5	4	3	2	2	1	2	2	3	3	4	35
Puente del Inca	7	0	2	0	2	5	7	6	4	4	4	4	1	39
Chos Malal	14	1	1	2	2	4	5	3	3	2	2	2	2	29
Bariloche	5	3	3	5	8	10	10	9	9	5	5	3	4	74
Choele Choel	11	2	2	2	3	4	2	2	1	3	3	2	2	27
Cipolletti	9	1	1	1	1	3	3	3	2	4	3	2	2	25
Camarones	6	3	2	2	4	4	6	4	3	4	3	2	2	39
Colonia San Martin	5	1	2	2	4	4	3	3	1	1	2	1	1	25
Colonia Sarmiento	8	3	3	4	4	6	6	4	4	4	5	3	2	48
Colonia 16 de Octubre	14	2	2	4	6	8	7	8	7	4	3	3	2	56
Puerto Madryn	11	2	2	2	4	4	4	3	2	2	3	2	2	32
Deseado	8	3	2	2	3	4	2	4	4	2	2	2	4	34
Gallegos	13	6	4	5	5	4	4	4	5	4	4	5	8	58
Santa Cruz	9	4	3	2	4	4	5	5	6	2	3	4	7	49
Ushuaia	6	11	10	10	10	11	9	8	8	7	10	10	11	115
		Mean number of days with snowfall												
San Luis	8	0.0	0.0	0.0	0.0	0.0	0.6	0.2	0.5	0.0	0.0	0.0	0.0	1.3
Bariloche	4	0.2	0.0	0.0	0.0	2.2	3.8	4.5	4.5	5.0	0.0	0.8	0.0	20.8
Puerto Madryn	11	0.0	0.0	0.0	0.1	0.3	0.5	0.3	0.4	0.1	0.0	0.0	0.0	1.7
Colonia 16 de Octubre	9	0.0	0.0	0.0	0.2	0.6	1.2	1.1	2.0	0.6	0.0	0.3	0.0	6.0
Colonia Sarmiento	4	0.2	0.0	0.0	0.0	1.0	1.2	2.0	1.0	0.0	0.0	0.2	0.0	5.6
Santa Cruz	4	0.0	0.0	0.0	0.2	0.2	2.2	2.5	1.2	0.5	0.0	0.0	0.0	6.8

[4] Stations are grouped by provinces and territories in the order that they appear in the table giving mean precipitation.

Wind.—In the northern littoral and middle mediterranean regions (Cordoba) the prevailing winds blow from northeast or southeast; at Buenos Aires and over the pampas (Trenque Lauquen and Victorica) the south component has disappeared and the winds generally come from north or northeast (from the east at Buenos Aires from September to March). Over the Andean region from Jujuy to Mendoza the prevailing directions are southeast, south, and southwest. From Chos Malal and Bahia Blanca southward westerly winds sweep over the land throughout the year or with short interruption along the coast in summer (Puerto Madryn, prevailing direction northeast from January to March).

All along the coast from Buenos Aires to southern Tierra del Fuego the winds are moderately strong in all seasons with a mean yearly velocity of about 8 to 10 miles per hour. Over the interior wind movement is generally rather light in the north, but in the region of the southern Andes and Patagonia it is comparable to that given for the coastal region.

The following paragraphs by Davis describe the zonda, a South American sirocco, and the well-known pampero: [12]

In the Andean region there is a dry, hot wind called zonda—a South American sirocco—blowing generally from the north or northwest and with such force as to make breathing difficult. In order to mitigate the extreme dryness and heat experienced during the winds, the inhabitants have recourse to artificial evaporation produced by sprinkling the walls and floors of their dwellings where they are obliged to take refuge. These winds are most frequent and intense during spring, especially during the months of September and October, beginning usually about noon and lasting until after sunset; at times, however, they continue two or three days without interruption, blowing with the force of a hurricane. The south wind which follows is accompanied by a sudden fall in temperature, often amounting to more than 45°, especially if the zonda has lasted more than a day.

In the mediterranean and littoral regions the intense heat which is associated with the north wind is often followed by thunderstorms accompanied by violent southwest winds known as pamperos, so called from their blowing over the pampas. They are usually of short duration, but at times, in the region of the Rio de la Plata, they continue to blow a day or more, having their greatest intensity during the first few hours. In the littoral pamperos are most frequent in winter and spring, although they occur throughout the year. The fall in temperature which accompanies the change in wind from north to south, although not so marked as in the interior where the air is drier, is felt more keenly, and not uncommonly the temperature fall within a few hours is 27° to 36° and on rare occasions even more.—Clima de la República Argentina. 1902.

TABLE 29.—*Wind data, Argentina*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
		Prevailing wind direction												
Corrientes	8	se.	ne.	se.	ne.	se.	ne.	ne.	ne.	ne.	se.	ne.	ne.	ne.
Paso de los Libres	8	se.	se.	se.	s.	ne.	sw.	s.	s.	se.	e.	se.	se.	se.
Rosario	8	se.	ne.	ne.	ne.	ne.	ne.	se.	se.	ne.	se.	se.	se.	ne.
Buenos Aires	45	e.	e.	e.	n.	n.	n.	n.	n.	e.	e.	e.	e.	e.
Trenque Lauquen	8	n.	n.	n.	n.	n.	n.	n.	n.	ne.	ne.	n.	n.	n.
Bahia Blanca	8	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.
Santiago del Estero	8	s.	n.	n.	s.	s.	s.	s.	s.	s.	s.	s.	n.	s.
Cordoba	8	ne.	ne.	ne.	ne.	s.	ne.	s.	ne.	s.	ne.	se.	se.	se.
Victorica	8	n.	n.	n.	n.	n.,s.	s.	n.,s.	s.	ne.s.	ne.	ne.	s.	n.
Cipolletti	8	sw.	w.	w.	w.	w.	w.	w.	w.	w.	w.	sw.	sw.	w.
La Quiaca	8	n.	n.	n.	n.	s.	w.	w.	s.	n.	n.	n.	n.	n.
Jujuy	8	s.	se.	se.	s.	se.	se.	se.	s.	s.	se.	se.	se.	se.
Tucuman	8	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
La Rioja	8	se.	s.	se.	se.	s.	se.	se.	se.	se.	se.	se.	se.	se.
Mendoza	8	ne.	ne.	ne.	sw.	sw.	sw.	sw.	sw.	se.	se.	se.	se.	sw.
Chos Malal	8	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	nw.	w.	w.
Bariloche	8	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
Puerto Madryn	8	ne.	ne.	ne.	nw.	nw.	nw.	sw.	nw.	nw.	ne.	sw.	sw.	nw.
Colonia 16 de Octubre	8	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	sw.	sw.	w.
Colonia Sarmiento	8	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
Santa Cruz	8	nw.	w.	nw.	w.	w.	nw.	nw.	w.	w.	w.	nw.	n.	nw.
Ushuaia	4	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
		Mean wind velocity (miles per hour)												
Corrientes	10	4.0	3.5	3.9	3.8	4.1	5.2	5.3	5.5	4.5	4.3	3.7	3.9	4.3
Rosario	10	6.8	6.6	6.2	5.2	6.3	6.1	7.2	7.6	7.3	8.4	8.1	7.1	6.9
Buenos Aires	10	10.0	10.5	8.9	9.9	8.3	8.8	9.8	10.0	10.9	10.1	10.2	10.1	9.8
Bahia Blanca	10	11.1	10.2	9.1	7.6	6.3	8.3	8.4	9.0	9.9	10.0	10.2	11.2	9.3
Cordoba	10	5.7	5.5	5.1	5.0	4.7	4.8	5.5	6.3	7.2	7.4	6.8	6.0	5.8
Cipolletti	10	9.6	8.9	7.3	6.2	6.6	6.2	6.5	6.6	9.0	8.7	8.8	10.2	7.9
Tucuman	5	2.7	2.2	2.1	1.4	1.4	1.4	1.6	1.8	2.4	2.4	2.2	2.4	2.0
Mendoza	3	3.2	2.7	2.7	2.7	2.8	3.1	3.6	4.0	3.4	3.1	3.1	3.0	3.1
Bariloche	----	8.1	7.7	6.3	6.3	8.3	8.6	7.2	6.8	6.5	6.6	7.7	10.5	7.6
Santa Cruz	5	9.8	11.2	9.3	8.0	8.1	9.0	7.0	5.9	6.6	8.4	11.6	10.4	8.8
Ushuaia	----	8.6	8.5	7.3	6.6	7.2	6.3	8.4	7.0	9.9	9.7	9.3	7.9	8.1

[12] In Handbuch der Klimatologie (third edition), Vol. III, pp. 542–546, Julius Hann gives a lengthy discussion of these winds.

TABLE 30.—*Thunderstorm and fog data, Argentina*

Station	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
		Mean number of days with thunderstorms												
Paso de los Libres	4	4.5	6.8	7.0	4.5	3.2	4.2	3.2	4.2	8.0	3.0	4.8	8.8	62.2
Ceres	8	5.0	3.9	4.6	1.9	1.2	0.6	0.8	1.5	2.1	3.1	4.8	4.8	34.3
Rosario	11	2.8	1.9	2.0	1.7	1.0	0.9	0.9	2.5	0.8	1.9	2.5	4.3	23.2
Buenos Aires	45	7.5	5.5	4.5	3.0	3.0	3.0	2.5	3.0	3.7	4.3	4.7	5.8	50.5
Bahia Blanca	21	2.1	2.0	1.7	1.2	0.6	0.4	0.4	0.5	0.6	1.8	1.9	3.3	16.3
Cordoba	28	6.7	5.6	4.8	1.7	1.2	0.5	0.4	0.8	1.9	4.4	7.2	7.5	42.7
Cipolletti	4	4.0	4.0	1.2	0.5	0.2	0.0	0.0	0.0	1.5	3.2	0.5	3.0	18.1
Tucuman	20	2.1	2.4	1.6	0.8	0.2	0.0	0.0	0.2	0.4	1.9	1.9	2.8	14.3
La Rioja	4	1.2	0.8	0.2	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.5	1.5	4.6
Mendoza	40	6.0	4.2	2.6	1.0	0.2	0.1	0.1	0.1	0.7	1.5	4.0	6.5	27.0
Rawson	13	1.8	0.7	1.0	0.5	0.0	0.0	0.0	0.4	0.3	1.1	1.1	1.6	8.5
Colonia 16 de Octubre	4	0.2	0.0	0.3	1.0	0.0	0.0	0.0	0.0	0.2	0.5	0.2	0.0	2.4
Santa Cruz	4	0.8	0.8	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	2.4
		Mean number of days with fog												
Santa Fe	15	0.0	0.3	0.1	0.4	1.0	2.0	2.0	2.0	0.3	0.1	0.1	0.0	8.3
Rosario	8	0.0	0.4	1.0	1.9	2.8	3.6	3.1	1.2	0.6	0.8	0.1	0.1	15.6
Buenos Aires	63	0.0	0.1	0.3	0.4	1.0	2.0	1.0	1.0	0.5	0.2	0.1	0.0	6.6
Bahia Blanca	47	0.0	1.0	1.0	1.0	0.0	1.0	0.0	0.7	0.3	0.7	0.0	0.0	5.7
Santiago	12	0.0	0.1	0.4	0.9	1.4	1.3	0.7	0.4	0.0	0.1	0.0	0.0	5.3
Tucuman	11	0.1	0.1	1.0	0.4	0.2	0.6	0.4	0.3	0.0	0.1	0.3	0.2	3.7
Colonia 16 de Octubre	9	0.6	0.6	0.6	2.3	5.1	6.8	4.3	3.7	1.7	1.1	1.4	1.1	29.3
Colonia Sarmiento	4	1.5	2.8	2.5	2.2	3.8	3.0	2.2	1.8	3.2	1.5	0.5	1.0	26.0
Santa Cruz	4	0.0	1.8	0.5	1.2	2.8	2.8	0.8	1.5	2.0	0.8	0.0	0.0	14.2

Tables 31 to 34 give climatic conditions at island stations in high southern latitudes as follows: Cape Pembroke, Falkland Islands [13] (51° 41′ S., 57° 42′ W., elevation 70 feet); St. John Harbor, Staten Island (54° 43′ S., 63° 47′ W., elevation 39 feet); Grytviken, South Georgia [13] (54° 13′ S., 36° 33′ W., elevation 13 feet); and Laurie Island, South Orkneys [13] (60° 44′ S., 44° 39′ W., elevation 23 feet).

TABLE 31.—*Climatological data for Cape Pembroke, Falkland Islands*

	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	10	54.9	54.5	52.9	48.4	44.1	41.0	40.1	41.0	44.2	47.1	49.8	51.8	47.5
Mean minimum	10	44.6	44.1	42.6	38.8	35.8	33.1	32.7	33.3	35.1	37.2	39.0	41.7	38.2
Mean	10	49.8	49.3	47.8	43.6	40.0	37.0	36.4	37.2	39.6	42.2	44.9	46.8	42.8
Mean, 6 observations	10	49.3	48.7	47.5	43.7	40.3	37.6	36.7	37.2	39.4	41.9	43.9	46.2	42.7
Highest	10	72	75	66	59	56	49	53	50	54	59	67	70	75
Lowest	10	34	33	32	27	28	21	19	21	27	29	28	32	19
Relative humidity														
Mean	10	80	81	83	83	85	88	88	87	85	82	81	81	84
Cloudiness														
Mean	10	7.1	7.0	6.9	7.0	7.2	7.3	7.3	7.0	6.9	7.0	7.0	7.3	7.1
Precipitation [a]														
Mean	22	2.74	2.35	2.30	2.34	2.82	2.22	2.14	1.89	1.35	1.50	1.98	2.71	26.34
Maximum in 24 hours	13	1.22	1.69	0.79	0.71	1.54	1.10	1.18	1.02	0.51	0.79	0.83	0.91	1.69
Mean number of days with precipitation	10	17	17	17	19	22	22	21	20	15	17	17	20	224
Mean number of days with snow	10	0	0	1	4	7	10	11	8	5	3	4	1	54
Wind														
Prevailing direction	10	sw.	w.	nw.	nw.	nw.	nw.	w.	nw.	nw.	nw.	sw.	sw.	nw.
Mean force, 0–10 Beaufort	10	4.4	4.6	4.6	4.6	4.4	4.3	4.3	4.3	4.5	4.5	4.6	4.2	4.4
Mean number of days with fog	10	6	3	5	4	3	5	6	4	5	5	3	5	54
Mean number of days with thunderstorm	10	0.9	0.6	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.4	1.0	3.8

[a] Data for Stanley, situated about 10 miles from Cape Pembroke. Record 1875–1877, 1881–1883, 1904–1914 in Geophysical Memoirs, No. 15, British Meteorological Office. London; 1915–1920, Smithsonian Miscellaneous Collections, vol. 79, p. 1149.

[13] Monthly records of pressure, temperature, and precipitation in Smithsonian Miscellaneous Collections, vol. 79.

TABLE 32.—*Climatological data for Staten Island (St. John Harbor)* [1]

	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum [2]	8	51.4	50.7	48.4	45.0	41.4	37.8	37.8	38.5	40.8	44.1	47.1	49.5	44.4
Mean minimum [3]	8	48.4	47.7	45.1	42.4	39.6	36.7	36.3	36.1	38.1	40.6	44.2	46.2	41.8
Mean	8	49.9	49.2	46.8	43.7	40.5	37.2	37.0	37.3	39.4	42.4	45.6	47.8	43.1
Highest [2]	8	65	66	63	62	52	49	48	47	54	59	59	64	66
Lowest [3]	8	36	36	30	28	26	19	18	14	15	28	32	35	14
Relative humidity														
Mean, 7 a. m., 2 p. m., 9 p. m.	8	77	78	79	82	84	87	86	84	81	79	76	76	81
Mean, 2 p. m.	8	71	73	75	79	82	86	85	82	80	75	72	70	78
Cloudiness														
Mean, 3 observations	8	7.2	7.2	7.5	7.9	7.9	8.1	7.5	7.5	7.3	7.0	7.0	7.4	7.5
Sunshine														
Mean daily duration [4] in hours	4	4.0	4.1	3.8	2.8	1.7	0.9	1.2	2.9	4.6	5.4	5.9	5.0	3.5
Precipitation														
Mean	8	5.47	6.65	5.94	6.10	6.57	6.69	4.88	5.00	3.74	4.29	4.84	6.77	66.94
Maximum in 24 hours	8	1.07	1.68	2.12	1.29	1.08	1.17	1.89	1.32	1.75	0.44	0.59	1.99	2.12
Mean number of days with precipitation	8	20	19	22	20	25	26	24	21	18	18	18	21	252
Mean number of days with snow	8	0.4	0.9	2.1	4.0	9.6	11.2	11.4	9.9	6.4	5.8	2.8	2.5	67.0
Wind														
Prevailing direction	8	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.
Mean hourly velocity	8	11.5	14.4	19.2	16.4	17.2	19.4	19.4	17.5	16.7	15.2	13.8	12.6	16.1
Mean number of days with fog [4]	4	5.0	2.0	2.0	4.0	2.0	5.0	0.1	0.0	2.0	2.0	2.0	4.0	31.0
Mean number of days with thunderstorm [4]	4	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.5	1.8

[1] The table is based mainly on observations in the period 1886–1895.
[2] Observations at 2 p. m.
[3] Observations at 7 a. m.
[4] Data for New Year Island (54° 39′ S., 64° 10′ W., elevation 174 feet).
Monthly records of pressure, temperature, and precipitation for New Year Island (Ano Nuevo) are given in Smithsonian Miscellaneous Collections, vol. 79.

TABLE 33.—*Climatological data for Grytviken, South Georgia*

	Length of record in years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	10	49.5	50.5	48.4	43.0	39.4	33.8	33.3	35.2	39.7	42.3	44.2	45.9	42.1
Mean minimum	10	36.0	36.1	34.9	31.3	28.2	24.3	22.3	23.4	26.8	29.3	32.2	33.1	29.8
Mean	10	42.8	43.3	41.6	37.2	33.8	29.0	27.8	29.3	33.2	35.8	38.2	39.5	36.0
Mean, 24 hours [1]	22	41.0	41.9	40.1	36.3	32.2	29.3	28.8	29.1	32.5	34.9	37.4	38.8	35.2
Highest [2]	15	75	80	78	66	60	57	55	54	63	67	68	69	80
Lowest [2]	15	26	28	24	19	14	9	9	−3	9	12	20	22	−3
Mean number of days with temperature 32 or lower [2]	5	12	9	16	20	30	29	26	29	25	27	22	15	260
Relative humidity														
Mean, 8 a. m., 2 p. m., 8 p. m.	10	76	78	76	78	78	77	72	75	75	72	74	74	75
Mean, 2 p. m.	10	73	74	70	74	76	75	72	75	73	69	69	70	72
Cloudiness														
Mean, 3 observations	10	7.5	7.0	6.9	6.7	6.9	6.5	6.3	6.5	6.2	6.7	7.5	7.4	6.8
Precipitation														
Mean [1]	20	3.35	4.14	5.06	5.28	5.54	4.96	5.49	5.06	3.44	2.59	3.38	2.94	51.23
Maximum in 24 hours	10	1.69	3.35	4.06	3.07	2.20	3.82	2.72	2.87	3.23	2.52	2.52	2.64	4.06
Mean number of days with precipitation	10	16	16	17	19	20	15	17	16	14	13	18	15	196
Mean number of days with snow	10	4	4	6	9	12	11	13	14	10	9	10	7	109
Prevailing wind direction	10	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.
Mean number of days with fog	10	3	3	3	3	3	1	1	1	2	2	1	2	25
Mean number of days with thunderstorm	10	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5

[1] Smithsonian Miscellaneous Collections, vol. 79.
[2] Supplementary data from Boletin Mensual, Oficina Meteorologica Nacional, República Argentina. 1919–1923.

TABLE 34.—*Climatalogical data for Laurie Island, South Orkney Islands*

	Length of record, years	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Temperature														
Mean maximum	8	35.6	36.1	35.2	30.7	25.2	22.1	18.7	22.8	26.6	30.4	32.7	33.6	29.1
Mean minimum	8	29.7	30.0	28.0	21.9	12.6	7.2	1.8	7.2	12.7	20.1	26.1	27.7	18.8
Mean	8	32.6	33.0	31.6	26.3	18.9	14.6	10.2	15.0	19.6	25.2	29.4	30.6	23.9
Mean, 24 hours [1]	21	32.2	32.7	31.1	26.6	18.9	14.9	12.9	14.5	19.6	25.2	28.0	30.6	23.9
Highest [2]	13	45	48	51	45	46	42	39	44	44	42	46	44	51
Lowest [2]	13	19	21	7	−8	−19	−27	−32	−40	−26	−24	4	8	−40
Mean number of days with—														
Minimum 32° or below	6	27	23	27	29	31	30	31	31	30	31	30	30	350
Minimum 0° or below	6	0	0	0	0	4	10	16	10	6	1	0	0	47
Maximum 32° or below	6	2	4	8	13	22	26	28	26	20	16	13	8	186
Maximum 0° or below [3]	6	0	0	0	0	....	2	3	3	....	0	0	0	10
Relative humidity														
Mean, 24 hours	7	86	87	88	89	92	93	93	94	93	90	90	88	90
Mean, 2 p. m.	7	85	84	87	87	92	93	94	95	92	89	89	85	89
Sunshine														
Mean daily duration, hours	8	2.0	1.8	1.2	1.1	0.6	0.2	0.6	1.5	2.5	2.1	2.0	2.4	1.5
Precipitation														
Mean [1]	18	1.48	1.54	1.82	1.73	1.32	1.16	1.20	1.38	0.98	1.01	1.37	0.89	15 89
Mean number of days with precipitation	8	28	23	27	26	27	25	25	25	24	28	26	25	309
Mean number of days with snow	8	20	17	19	24	25	24	24	24	23	27	24	23	254
Wind														
Prevailing direction	7	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	se.	nw.
Mean hourly velocity	8	11.2	13.4	14.7	14.4	13.0	11.8	12.4	13.4	14.6	14.5	13.2	10.6	13.1
Mean number of days with fog (or mist)	8	16	12	16	13	18	18	19	20	18	17	16	13	196
Mean number of days with thunderstorm	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.2

[1] Smithsonian Miscellaneous Collections, vol. 79, pp. 1155–1156.
[2] Record for 1919–1923 given in Boletin Mensual, Oficina Meteorologica Nacional, República Argentina.
[3] May and September, one day in six years.

MONTHLY AND ANNUAL RECORDS OF PRECIPITATION FOR SELECTED STATIONS

World Weather Records, Smithsonian Miscellaneous Collections, vol. 79 (1927) contains monthly records of pressure, temperature, and precipitation for a number of stations, as indicated in footnotes to Tables 6, 8, 10, 12, 15, 19, 24, 28, 31–34.

The records presented here for Bahia Felix and Los Guindos, Chile, are an important addition to these just mentioned in that they relate to the rainiest regions of southern South America.

For comparison with the above heavy rainfall there will be given the greatest annual amounts (in inches) recorded at stations in other regions of moderate or heavy precipitation as follows: Corrientes, 72.13 (1878) in 49 years; Buenos Aires, 79.65 (1900) in 64 years; Posados, 82.09 (1905) in 22 years; Montevideo, 94.47 (1914) in 24 years; Valdivia, 140.67 (1868) in 50 years; and Evanjelistas, 141.09 (1909) in 23 years.

TABLE 35.—*Precipitation: Monthly and annual totals, means, and extremes (in inches)*

BAHIA FELIX, CHILE

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual
1913	.....	.....	.....	.....	.....	5.68	10.10	10.98	23.26	17.91	19.57	15.67	.....
1914	15.43	25.10	24.63	.....	15.22	7.74	7.04	12.46	7.80	9.63	13.89	15.91	.....
1915	15.17	22.08	22.06	13.50	14.20	15.03	24.48	15.11	22.17	16.44	22.94	19.15	222.39
1916	17.84	17.62	21.25	18.52	31.13	17.12	15.50	11.81	20.29	11.46	15.35	19.24	217.13
1917	20.45	20.45	26.15	23.44	23.18	14.79	31.13	11.64	11.65	22.65	17.04	19.96	242.53
1918	21.40	20.11	17.55	21.67	13.15	21.09	10.45	7.95	10.39	17.02	17.61	25.68	204.07
1919	18.61	7.03	13.09	10.96	3.65	13.78	12.83	11.33	17.75	15.78	15.82	11.54	152.17
1920	18.61	16.72	16.33	21.76	10.73	18.09	18.89	17.69	21.77	10.33	12.75	21.54	205.21
1921	18.03	19.04	22.49	18.91	8.70	18.18	22.73	12.83	15.83	12.65	21.05	15.64	206.08
1922	22.39	19.52	7.59	21.22	23.37	13.59	21.13	23.56	14.31	9.47	21.57	12.32	210.04
1923	15.16	15.86	12.57	20.98	21.09	10.93	7.14	7.01	18.02	6.13	16.65	14.84	166.38
1924	10.91	14.28	22.75	17.93	23.01	17.56	14.66	21.24	14.33	9.60	23.48	21.23	210.98
Mean	17.64	17.98	18.77	18.89	17.04	14.46	16.34	13.63	16.46	13.26	18.14	17.72	200.33
Greatest	22.39	25.10	26.15	23.44	31.13	21.09	31.13	23.56	23.26	22.65	23.48	25.68	242.53
Least	10.91	7.03	7.59	10.96	3.65	5.68	7.04	7.01	7.80	6.13	12.75	11.54	152.17

LOS GUINDOS, CHILE

1918	6.10	0.00	7.95	13.15	21.38	19.80	20.98	15.90	9.80	4.02	25.35	0.75	145.18
1919	1.46	1.80	2.57	11.00	46.07	17.44	41.16	14.05	20.24	3.41	18.04	4.24	181.48
1920	0.41	0.00	14.03	5.56	47.15	17.50	8.02	16.34	3.68	7.13	18.72	1.82	140.36
1921	6.55	6.39	4.42	31.33	45.59	17.19	8.57	25.95	3.82	3.61	0.77	11.35	165.34
1922	6.69	0.84	14.19	2.12	11.39	24.92	39.87	21.74	9.07	10.32	1.39	0.00	142.54
1923	1.91	6.08	8.94	1.77	5.06	22.31	16.09	22.65	9.22	14.48	4.27	3.93	116.71
1924	0.00	5.65	9.25	3.64	10.70	21.65	17.51	6.17	4.37	2.20	0.70	0.31	82.13
Mean	3.30	2.96	8.76	9.80	26.76	20.11	21.74	17.54	8.60	6.45	9.89	3.20	139.11
Greatest	6.69	6.39	14.19	31.33	47.15	24.92	41.16	25.95	20.24	14.48	25.35	11.35	181.48
Least	0.00	0.00	2.57	1.77	5.06	17.19	8.02	6.17	3.68	2.20	0.70	0.00	82.13

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